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ABSTRACT

This report, the second in a series of six, presents the findings of evaluative studies of six Level I Model Technology School sites which were conducted as part of Phase II of the California Educational Technology Assessment Program. The project sites are: Alhambra City School District (two schools); Cupertino Union Elementary District and Fremont Union High School District (two schools); Los Angeles Unified School District (two schools); Monterey Peninsula Unified District (four schools); Hueneme Elementary District (one school); and Sacramento Unified School District (three schools). Data were collected from four sources: (1) key documents about the projects, including the original proposal, annual reports, and products produced by research partners for each project; (2) two site visits to each project site; (3)a self-assessment inventory; and (4) student, teacher, and visitor surveys. The report begins with background information on the Educational Technology Local Assistance Program, Educational Technology Assessment Program, and this study. An overview of the Model Technology Schools (MTS) Level I is then provided, including background information, program planning, program development, project implementation, management of resources, support funding, outcomes, and current status. A detailed description of the study design is followed by separate reports on each of the project sites. It is noted that, although the primary purpose of this volume is to provide a descriptive account of the MTS Level I Projects, the summary that concludes this report contains some cross-site descriptive information. The MTS Level I Evaluation Data Collection Instruments (including both English and Spanish versions of the student questionnaire), survey results, and interview protocols are appended. (AEF)

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Comprehensive Study of Educational Technology Programs Authorized from 1989-1992

Volume II

Model Technology Schools, Level I

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Volume II

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Chapter I
Introduction

The Education Technology Act of 1989 (California AB1470) established the Education Technology Local Assistance Program to continue and initiate several education technology programs. Six separate, statewide education technology projects were funded through this legislation: the School-Based Grant Program; the California Technology Project; the Instructional Television Agencies Program; the Software Development Program; the Model Technology School Level I Program; and the Model Technology School Level II Program.

An important provision of AB1470 calls for an independent evaluation to examine program components and describe "procedures for the effective utilization of evaluation information to develop policy for use of educational technology" (Sec. 51876.5 [d] EC Chapter 1334). The Far West Laboratory for Educational Research and Development (FWL) and its subcontractor, the American Institutes for Research (AIR), were selected to conduct this evaluation. The evaluation has five phases:

- Phase I provides a detailed description of the 19 Educational Technology Local Assistance programs previously funded by the state under the provisions of prior educational technology legislation in the state (AB803). Some of these programs (e.g., the Model Technology School programs) are still in operation. For these programs, the Phase I analysis presents a history of these programs from inception through 1989.

- Phase II presents a descriptive analysis of the six programs funded by AB1470.

- Phase III is the quantitative and comparative analysis of these projects.

- Phase IV produces evaluation templates and guidelines for local education agencies to use in future education technology projects. (This phase has actually been moved up to precede the Phase I analysis.)

- Phase V creates an Executive Summary Report for the overall evaluation that provides a concise summary of all phases of the study.

This report presents the Phase II findings for the six Level I Model Technology School (MTS) sites, describing the projects and the ways in which they evaluated and disseminated information about their programs. The six project sites are:

- Alhambra City School District (two schools)
- The Cupertino Union Elementary District and the Fremont Union High School District (three schools from two districts collaborating on one project)
- Los Angeles Unified School District (four schools)
- Monterey Peninsula Unified District (four schools)
- Hueneme Elementary District (one school)
- Sacramento Unified School District (three schools)

There were four steps to the data collection process for each of these sites. First, the MTS Level I evaluation staff obtained key documents about the projects. This included the original proposal, annual reports, and products produced by the research partners for each project. These were used primarily in conjunction with the Phase I analysis which is presented for the MTS Level 1 project as Chapter III of this report.

Second, two sets of site visits were made to each project site. The first visit was designed to provide a brief orientation to each project for the evaluation team prior to the completion of Phases I and IV of the analysis and the development of the instrumentation for the Phase II and III analysis. The second set of visits were more extensive and were for the purpose of on site data collection.

Third, prior to the second set of visits, an extensive self-assessment inventory instrument was forwarded to each site. These self-assessment guides are the centerpiece of Phase IV of the evaluation, which provides guidelines for future local self-evaluation. These templates provide much of the data presented in this report.

Fourth, prior to and during the second set of visits, surveys were distributed to a sample of students and to all teachers and to all visitors at each project school.

In the following chapters, we synthesize the information obtained. Chapter II (a reprint of the MTS Level I component of the Phase I Report currently under review by the California Department of Education) describes the history of the Level I projects from their inception through 1989. Chapter III explains the design of this evaluation. Chapters IV through IX provide descriptions of each of the six Level I projects in case study formats. Chapter X presents some comparative data, primarily in a descriptive format, and some preliminary conclusions.

The main purpose of this report is to summarize the data collected for the MTS Level I evaluation. Interpretation of findings, cross-site analyses and recommendations are de-emphasized in this volume and are primarily reserved for the upcoming Phase III Report.

Chapter II
Model Technology Schools: Level I

I. Background Information

In 1986 the California Department of Education (CDE, 1986c) stated the rationale for the Model Technology Schools (MTS) projects: "State supported model technology schools/teacher training centers will greatly enhance the long-term potential contribution and cost-effectiveness of instructional technology." The program was to be a five-year research and development effort. The vision of the Level I projects was to explore the full potential of technology by implementing teaching strategies that required innovative uses of a wide range of technologies. The legislative authority for the MTS Level I program was Assembly Bill 803.

A state-wide competition was held to identify the MTS Level I sites. The CDE collaborated with the Educational Technology Committee to develop the specifications for the solicitation. The process began in November 1986 when five-page preliminary proposals were solicited from all school districts in California. The field was narrowed in February 1987 when 16 finalists were invited to submit comprehensive proposals (CDE, 1987b). A panel of experts reviewed each proposal, visited the proposed site and recommended awards to the Superintendent of Public Instruction.

Through this process, five sites received MTS grants in 1987-88: Alhambra City and High School District; Cupertino Union School District; Fremont Union High School District; Los Angeles Unified School District; Monterey Peninsula Unified School District; and the Sacramento City Unified School District. In 1988, the Hueneme Elementary School District/Oxnard Union High School District was added as the sixth MTS site through a bill enacted by the California legislature.

II. Program Planning

The MTS Request for Proposals describes the long-term, state-wide objectives for the MTS projects:

1. Demonstrate instructional technology use that supports state curriculum frameworks.

2. Develop quality teacher and administrator training models for implementing staff training systems.

3. Support and disseminate research on the effective implementation of instructional, administrative and home-school uses of technology in schools.

4. Field test and promote the development of new information technology products that support state curriculum and instructional objectives.

5. Determine facility standards required for the efficient use of computer, video and interactive technologies in both existing and new schools.

6. Disseminate results of the Model Technology Schools project so that decision makers and other educators can make optimum use of the information.

The RFP contained several other noteworthy features:

1. Critical areas of research, development of curriculum products, and teacher training provided the cornerstones for each project.

2. Partnerships between the public schools and universities, business, industry, parents and other local organizations were expected to enhance the creativity and vision of the projects. The university partners could enrich the research components and the business partners could provide leading edge technologies and expertise.

3. Management of each project was to include a Director, a Research Coordinator, a Curriculum Coordinator, and a Training Coordinator.

4. Research designs were the responsibility of external agents either university-based, or independent firms.

III. Program Development

The MTS Level I projects are distinguished by the mandated emphasis on research and evaluation. Each project was free to identify a "central learning issue" from which a conceptual framework and the research questions would be derived. The three key areas to be investigated were: instruction, school climate, and school management. The independent research partners were to develop five-year longitudinal studies of the effects of the proposed activities.

The "18-Month Report" of the MTS Level I projects (California State Department of Education, Spring 1989) summarized the basic approaches of each of the six projects:

Alhambra. Emphasis is on student-centered learning in a technologically-rich environment. Student-centeredness refers to the power of choice, self-control, and self-monitoring that students apply to their education.

Cupertino/Fremont. This is a teacher empowerment project. The focus is to provide teachers appropriate access to technology, to increase their productivity, and to enhance their methods of classroom delivery through the use of technology-assisted strategies.

Hueneme/Oxnard. The focus is student-teacher interaction and to demonstrate that intelligent use of technology significantly improves both the quality and quantity of student-teacher interactions. The focus is on higher order thinking skills and the key is the "smart classroom, a multi-media curriculum system."

Los Angeles. Here the focus is on English/Language Arts because many of the students in the projects schools are not primarily English language users. Thus there was a need to improve listening, speaking, reading, and writing skills in English.

Monterey. The basic approach is a school-based decision-making approach to integrate a variety of technologies into curriculum and instruction. The major emphasis is on cost-effectiveness and development of "proactive behaviors" such as higher order thinking skills and student interest in schools across curriculum areas. The secondary focus is a computer-based school management system.

Sacramento. The curriculum focus emphasizes critical thinking skills and writing across the curriculum. The components of this project include an information resource center, classroom, student and teacher work stations, an authoring work station, and home-based site programs.

Each site selected its own research partner with whom it developed a research agenda. For example, Alhambra examined the planning and implementation process and the changes in teacher-student interactions, Hueneme/Oxnard focused on student achievement and Monterey investigated student proactive behaviors. In 1988, the CDE commissioned a study (Stecher, ETS) to summarize the initial two implementation years and where possible, to analyze findings across sites (only five were included as the sixth site was just getting underway at the time of the study).

A report by the Educational Testing Service (Stecher, 1989) addressed three areas: (1) management; (2) staff development; and (3) instruction/curriculum. The report states that in 1989 the MTS projects were on the way to meeting their objectives. The following summary is paraphrased from this report and included in this document because it portrays the reality of the developmental process.

1. *Management.* The projects experienced long delays in implementing programs that required revised plans and schedules. The delays occurred at the beginning of the projects because the award was not always followed by receipt of funds. Even if a district could advance funds to the project, delays occurred in acquisition and installation of hardware and software, and in negotiating arrangements with business partners. The delays were not common across sites, nor did they have the same impact across sites. Overall, the visions held, the schedules were adjusted, frustrations eventually gave way to excitement, and the implementation moved forward.

2. *Staff Development.* Schedules reflected delays in acquisition of the hardware and software. Some sites adjusted to the delays by focusing on teaching strategies such as cooperative learning, higher order thinking skills, and defining anticipated student behaviors. Staff development training varied according to site and school preference. Teachers attended large-group instruction or received one-on-one technical assistance: the instruction was provided by business partners, outside consultants, or district personnel. Emphasis was on learning about available software, operating the hardware, and integrating the technology into the curriculum. To attend these sessions, teachers received release time, volunteered personal time after school and on weekends, or received compensation.

3. *Curriculum.* Across all projects, the major emphasis was on curriculum rather than technology per se. Technology was viewed as a means for transmitting knowledge rather than the focus of instruction. Today's students are video-oriented. They watch television, play computer games, and use VCRs at home. The projects reported capitalizing on this interest by integrating ITV, video, laserdisc, camcorder, and computer technology to deliver instruction. The project's content reflects the California Curriculum Frameworks. Teachers develop their own plans individually or with a partner or team. Units may focus on a particular curriculum area or be cross-disciplinary.

Two other key aspects of the Level I projects deserve mention.

1. *Dissemination.* Each project is to develop products for dissemination throughout the district and the state. While this is a high priority, the major activity on this component is not scheduled until the fourth and fifth project years. However, each project began to develop products early in the implementation phase. For example, the Monterey project produces Classroom Intervention Plans (CIPs) which are self-contained plans (i.e., using a computer to compose music) that will be packaged and made available to educators. Cupertino/Fremont offers training institutes to educators within and outside of the districts.

2. *Evaluation.* The RFP specified "research and evaluation" activities. The six independent contractors who designed the research activities also conducted evaluation activities. Stecher distinguishes between the two activities. The focus of the evaluation in the early years was "formative" in order to provide feedback to project management about the implementation. These findings were used by project managers to modify components such as training, software selection, teacher participation in decision-making, and product development.

The relationship between the project managers and the research/evaluators varied by project. Evaluators may sit on the management teams, meet frequently with project teachers to provide ongoing feedback, or simply appear on site to administer data collection instruments. The RFP permitted such latitude.

V. Project Implementation

The implementation of the MTS projects is briefly summarized by site, as described in the MTS 18-month report (1989).

Alhambra. Emery Park Elementary School (K-8) and Alhambra High School (9-12)

In 1989, the project explored a variety of technologies, including computer use at home, in the lab, in the halls, and in the classroom. Video, telecommunications, laserdiscs and satellite reception were included in the initial implementation. Student and teacher progress was recorded at three levels: a novice or beginning role; an intermediate or exploratory role; and a sophisticated user, ready to share knowledge with others. New classroom practices such as cooperative learning and the use of integrated language arts throughout the curriculum were used to empower students and teachers. A home-school component trains parents to use technology. Emery Park, the elementary school, was in its product development year.

The high school component phased in Cadre I by exploring the potential of Writing Across the Curriculum in a Macintosh lab environment, participating in a math/science IBM supported teacher demonstration project; installing a Tandy supported laptop project that gave 11th grade students electronic notebooks to organize lessons and "chat" on a district bulletin board; and installing a HyperMedia laboratory.

Cupertino-Fremont. Garden Gate Elementary School (K-6), Kennedy Junior High School, Monta Vista High School

The project focused on the elementary school during its first year, but involved a cohort of six teachers from the junior high and high schools. Each teacher prepared a Personal Learning Plan that specified the equipment, courseware, and software to be used. Instructional goals were included in the plans. The staff provided technical support in writing the plans, selecting equipment and software, and the training. The staff responded to identified training needs by the teachers and offered workshops, seminars, and classes. Teachers earned credit on the salary schedule for after-hours participation. During the second project year, support to the elementary school continued as the junior high school became the focus. Technology plans were developed by each department prior to individual teacher plans. The high school added a second cohort of teachers and began to develop implementation plans.

Hueneme/Oxnard. Blackstock School (6-8)

In 1989, project activity focused on a classroom that contained 36 individual learning stations. An interactive network, the "heart" of the system, delivers the individualized student instruction. The curriculum combines a variety of sources from different companies which are managed electronically through a single system. Open electronic architecture permits additions to the curriculum. Each student receives visual, verbal and numeric information from a computer-linked network of central data bases. The hardware includes interconnected and individual computers, a microwave satellite dish, VCRs, color video camera, interactive laserdiscs, CD-ROM, telephone modems, touch screens, scanners, bar coding, graphics printers, and robotics. Teachers have more time to devote to individualized instruction because record keeping, clerical chores, and attendance are done by machine. Comprehensive student profiles are maintained, which record learning styles and individual progress. The project design strives for higher student performance and morale.

Los Angeles. Corona Avenue School (K-5), Loma Vista Avenue School (K-5), Nimitz Junior High School (6-8) and Bell High School (9-12)

Visual, auditory, kinesthetic, and cognitive stimulation in several areas of instruction are provided to inner-city students. Computers are featured. Other technologies used include: videodisc players, CD-ROM players, modems, graphics scanning devices, video digitizers, special measuring devices, color video display monitors, and video cassette recorders. The video production component includes color video cameras, video cassettes, recorders, editing source and record video cassette recorders. Each project teacher received training on the various technologies, the State Curriculum Frameworks, and instructional strategies for integrating the technology into the curriculum.

Monterey. Manzinita Elementary School (K-5), Ord Terrace (K-5), King (6-8), and Monterey High School (9-12)

The implementation centers on teacher-developed Classroom Implementation Plans (CIPs) that describe student needs, technology and/or student centered intervention objectives and strategies, implementation activities, professional development requirements, anticipated products, schedule of events and estimated costs. This process integrated a variety of technologies including ITV, computers, interactive laserdiscs, calculators, and telecommunications. Targeted student populations include: special education, bilingual, low achievers, GATE, and mainstream students. In 1989, CIPs were developed at the elementary and middle schools. An additional key feature of this MTS project is the school-based planning process whereby site-based teams decide on training activities, equipment purchases, and use of personnel in the implementation process.

Sacramento. Edward Kemble Elementary, C.M. Goethe Middle School, and Luther Burbank High School

Here the emphasis is on critical thinking and writing across the curriculum. The project has adopted a "networking" model that features schoolwide computer and video networks with either a single or a number of computers, a teacher station and a large screen monitor. Information Centers permit student access to a variety of electronic resources or they can participate in teacher-directed activities. This is called a "distributed model." At the elementary school, teachers created technology-integrated, thematic instructional units. The middle school teachers participated in a variety of training activities as site capital improvements were occurring.

The overall implementation plan called for acquisition-training activities for the elementary schools in year one (1987-88), acquisition-training for middle schools in year two (1988-89), and acquisition-training for the high schools in year three (1989-90). The fourth and fifth years were to feature product completion, preparation for and dissemination of products and services, and training sites.

V. Management of Resources

In general, each project functioned independently. However, some examples of sharing resources across sites exist. For example, promotional materials used by all projects such as a MTS video and a MTS brochure were developed with funds contributed by all sites. In addition, Project Directors coordinated attendance and presentations to conferences such as CUE, ASCD and/or prepared joint presentations to conserve funds. Although representatives from each project did not attend all conferences, but at least one MTS site was present at all major professional conferences.

VI. Support Funding

The level of funding for each of the six projects is $500,000 for each project year. In addition, the districts must contribute $50,000 annually to the project. Five of the six research and evaluation contractors received from $80,000-$100,000 annually. One project used the evaluation services of the district evaluation office.

VII. Outcomes

In 1989, MTS outcomes are summarized in the ETS report (Stecher, 1989):

1. Three strengths of MTS are: the infusion of technology within central themes, strong emphasis on staff development, and recognition that

reform/major changes occurs over time. One year is insufficient to expect change.

2. Two weaknesses emerged: incorporating basic research in development/demonstration projects and expecting site-specific independent research and evaluation efforts to produce generalizable conclusions about a state-wide initiative.

3. Business and industry partnerships brought equipment donations, use of MTS sites for field testing, and visibility. Long-term benefits are uncertain.

4. Initial implementation costs for capitalization, training, and materials acquisition are high.

5. The use of a long-term demonstration project to benefit schools throughout the state is being assessed. The dissemination phase will be critical to this effort.

VIII. Current Status

MTS projects continue their implementation as planned. Each year the number of participating schools, teachers, and students has increased. Products to be disseminated and services offered within and outside of the district are becoming more refined and more available. Site schools continue to integrate MTS into their individual educational agendas.

Chapter III
Study Design

The purpose of this study is to conduct an overall evaluation of the Model Technology School (MTS) Level I project, and ultimately to compare this project with the other components of the Educational Technology Local Assistance Program. This chapter describes the design for this evaluation. In considering this design, it is important to understand the relatively high degree of autonomy granted each project and the considerable diversity that has resulted across projects. It is also important to discuss the very large body of project-related assessment activities which precede and coincide with this evaluation project. This chapter begins with a section on project autonomy, followed by a section that describes prior evaluation efforts. After presenting this background information, we examine the pursuit of common project goals and the need for common assessment criteria. The chapter concludes with a description of study design and procedures.

I. Project Autonomy

The main goal of the project was to infuse technology in a select set of feeder schools, covering grades K-12, for the purpose of allowing the state to assess the impact of concentrating resources on technology in a few sites. The feeder school concept was important to allow an assessment of the effects on students over time as they progressed through the grades at these project sites. These projects were also to serve as models for schools across the state as to what could be accomplished when technology became a major emphasis of a select set of schools, and when sufficient resources were provided to allow the vision of some of the state's most progressive local educational technology leaders to become reality. These sites were to serve as lighthouses in terms of technology use.

There are at least three levels of comparative analysis in this study: the MTS schools within each project district(s), the six Level I projects in relation to one another, and the overall Level I component of the Educational Technology Local Assistance Program in relation to all of the other components. The units of observation at each of these levels of analysis were generally granted high degrees of autonomy at the outset of this project.

This was because an important element of this overall vision for the MTS Level I project was that the sites must be given the latitude to pursue their projects as they were initially and uniquely envisioned and to allow them to naturally evolve and develop through the trial and error processes traditionally associated with new project implementation. Indeed, these projects were selected for the strong, unique visions and purposes articulated in their initial proposals to the State. Considerable differences were contained in the approaches initially proposed by each of the six project sites. Although these have been somewhat modified through the processes of implementation, all six projects remain quite unique in the way that they have carried out their overall technology mission.

For example, while all of the projects have been given a grant of $500,000 per year to infuse technology in a select group of schools, two of the projects have spread these resources across four schools, two across three schools, while one project has two schools, and the remaining project has only one school. Thus, despite the fixed grant award, the intensity of project resources at each of the project schools varies considerably across projects. While some projects are teacher-centered, others are student-centered. While some schools make participation in the project mandatory for all staff, other schools purposely only include a select cadre of staff, and sometimes bar inclusion to other staff members. While some projects feature a strong core of centralized training, others rely more heavily on peer tutoring among faculty. Although an initial requirement for participation was a set of feeder schools covering grades 7-12, one project has only one school with grades 6-8.

Variation also extends beyond the six projects. At many of the sites, each of the schools within the project is also quite unique. The same spirit of independence and autonomy, which was embodied in the project inception at the state level, was also infused in many of the project plans for local implementation. Because many project directors reported the belief that a "top-down" approach was as ill-advised for the district as it is for the state, each school was given the autonomy to implement their own technology objectives in ways that best-suited their local environment. Each school entered the project with differing levels of technology experience, had differing skill levels among existing staff, embodied different leadership styles in their school administration, and had differing visions about the types of technological applications that they were most interested in and what they wished to do with this technological opportunity.

In one respect, this high level of diversity has clearly benefitted the overall MTS Level 1 project. If the six sites would all have had to follow a rigid set of guidelines in implementation, the overall richness of the project as a whole would be diminished. As it is, there are six diverse sets of project sites that educators from around the state, nation, and to some extent the world have been able to visit. And, according to the results of the Visitor's Survey, as presented in Appendix B, they have found considerable benefit in these visits. However, as noted by Stetcher in a prior evaluation of the MTS Level I sites (1989), the virtual complete autonomy granted each site create serious difficulties for project wide evaluation. To quote from the first recommendation in the Executive Summary: To permit an overall assessment of the value of the MTS program, the six MTS projects should be asked to identify important common outcomes and ways to measure them that will provide a reasonable reflection of the projects' accomplishments.

II. Local Level I Evaluation Efforts

At the project level, the concept of autonomy was also manifested in the requirement that each project must establish an independent research component. These six research teams provide independent feedback and assessment to the project leadership teams and to the CDE. They monitor and evaluate the implementation processes at each site, report findings, and provide feedback to local and state leaders that could affect mid-course corrections that might be needed in the implementation at every local site as well as the overall statewide project. These research teams have become rather formidable components of each project. Approximately, 15-20% of overall project resources are allocated for research during each year of implementation. These research teams are, for the most part, quite independent of the project management: three are university-based and two are conducted by independent research firms. At only one project site is the research team a component of the assessment division of the district.

These research teams are also quite autonomous in the nature of their activities. In retrospect, perhaps more guidance could have been provided in relation to the exact purpose and orientation of these local research components. However, the evaluation process that has evolved now allows us to examine six rather independent models of how such assessment processes might occur, or perhaps whether they should occur at all in such an independent manner. Another approach could have been the development of a single project-wide assessment component that would have used common instruments to assess the progress of each of the projects through the implementation years. Through such an approach, a more common set of program goals might have developed and similar measures for assessing and evaluating the progress of each project's approach to meeting these goals evolved.

Although more will be said about the evaluation component of this project in the Phase III report, the evaluation teams varied considerably in the approach each took to their assessment task. A fundamental difference across the six teams was the degree to which they engaged in formative as opposed to summary types of assessment activities. In a formative assessment process, the evaluators tend to be more actively involved in project implementation providing feedback on a frequent basis for the purpose of affecting the implementation of the project through mid-course corrections. Summary evaluators, on the other hand, are more inclined to distance themselves from the process. The purpose is to take a more detached view of the project as it unfolds. They collect and analyze their data in relative isolation and present their findings in a more retrospective manner.

The research teams varied considerably on this and a number of other dimensions. For each project, the research agenda and the mode of operation for the research team vis a vis the project team was derived locally. At some sites the researchers served as important, if ex officio, members of the project leadership and implementation team, actively involved in meetings and making recommendations on a regular basis; at other sites, it was reported that the researchers were seldom seen and served in rather distant roles.

III. The Need for Common Assessment Criteria

For these reasons, despite the considerable investment on assessment at each site prior to this project-wide evaluation, very little has been done on a project-wide basis. For the most part, the schools within each project, each of the projects, and each of the ongoing assessments have tended to evolve independently of one another. Thus, prior to this project, no common evaluation instruments have been developed, no common data collected, and no common assessment criteria formulated.

The one prior comprehensive assessment effort of the MTS Level I project, conducted by Stetcher in 1989, noted this same difficulty. According to Stetcher, there were two primary weaknesses in the MTS model: the belief that basic research could be conducted in the context of a development and demonstration project, and the notion that site-specific independent research and evaluation efforts would produce generalizable conclusions about the statewide MTS program as a whole. If the state wants answers to particular policy-related questions regarding the overall MTS program, a single external evaluator should be hired to produce a summary evaluation of the program. While recommendations for common assessment criteria were issued by the CDE Office of Education Technology after the release of this report, such common project objections were never implemented. Thus, the considerable body of prior assessment data that have been generated in conjunction with this project over the first four years of implementation were of relatively little use in meeting the objectives of this study, which is an evaluation of the MTS Level I project as a whole.

Consequently, despite the fact that a separate fully developed evaluation was being conducted at each site during the time in which this study was being conducted, a full set of additional evaluation instruments had to be developed for this sixth, project-wide, evaluation effort. This placed a considerable burden on each of the project sites as, for the most part, a greater level of resources were invested in each of the six local evaluations than in this system-wide assessment effort. Although this supplemental assessment effort was a source of some resentment on the part of many of the project respondents, it was felt that to adequately evaluate this project on a system-wide basis a full set of common assessment instruments and procedures would have to be developed and carried out.

For example, project tours for visiting educators and others were an important component of the dissemination effort for each project. While some of the projects had developed visitor's surveys which provided information about who these visitors were, what they had hoped to see, and the extent to which this had been accomplished, other sites were only keeping a simple count of visitors. In an attempt to develop some uniformity in the data on the number of visitors seen across sites and their impressions, a single visitor's survey was developed in conjunction with this project for use across all of the Level I sites. While this was an important element of the type of system-wide assessment effort being conducted for this project, it was also quite disruptive to local evaluation efforts. It is difficult enough to get visitors to complete one survey, let alone two. Thus, the projects with visitor's surveys already in place had to abandon them mid-year in favor of this system-wide instrument.

Similar difficulties were encountered in the other types of instruments developed for this study. The local evaluators and the system-wide evaluators were both asking teachers to fill out surveys. Student surveys also overlapped as did the need for staff to spend time with both teams of evaluators. Finally, the extensive self-assessment template completed by each project team constituted a considerable burden, especially in addition to the demands placed upon them by their local evaluators.

Thus, the study design and procedures described in the following section were, for the most part, unique to this study and were not able to substantially borrow from the individual project evaluation efforts.

We believe that such duplication should be avoided in the subsequent implementation of projects of this type. As valuable as it may be for development and demonstration projects to be autonomous in the way they carry out their activities, some clearly stated, system-wide goals and assessment criteria should be set out at the onset. As some type of system-wide assessment and comparative analysis will always be an important ingredient in such an endeavor, provisions should be made to ensure the viability of such evaluation efforts in as efficient a way as possible. Toward this end, it is important to carefully balance the levels of resources allocated to assessment in relation to project implementation and to ensure that the burden generated by the evaluation task does not seriously interfere with the successful implementation of the project, by directing time and resources away from its day to day requirements. If a local evaluation component is deemed important, the specific goals of these local efforts should be clearly specified, the primary audience for their findings should be identified, and the relationship of the local assessment to the project's system-wide evaluation effort should be thought out in advance.

IV. Study Design and Procedures

As briefly described in Chapter I, there were four elements to the data collection conducted in conjunction with this project:

- Prior project reports and documents were obtained.
- Two visits were made to each project.

- A self-assessment inventory was completed by each project.
- Visitor, student, and teacher surveys were administered at each site.

The full set of instruments for this study is included with this volume as Appendix A and results from the surveys are shown in Appendix B. Each of these procedures is described below.

The evaluation team attempted to obtain the reports and documents available from each site. Direct appeals to project directors, the research team, and the CDE were made to obtain as much of this prior documentation as possible. These included the initial proposals submitted by each site to the state, annual reports written by the project teams, and any evaluation reports issued by the research partners.

These materials were most useful in writing the Phase I Report for this analysis, which as described above, presents a descriptive analysis of the project from inception through 1989. They have also been used, to the extent that they are relevant, in conjunction with the Phase II and Phase III analysis. It was hoped that the prior research findings could be brought together and at least partially presented in some form of mega-analysis, but the considerable differences across projects and the lack of common research methods, as described above, precluded this. We also attempted to borrow from the data collection instruments being used by the local research teams as much as possible. It was felt that this might serve to somewhat reduce respondent burden. Although useful examples and some specific questions were pulled from these individual project research efforts, to ensure uniformity in data collection procedures and data collection over a common time span, we were not able to use these prior data.

Two sets of visits to each project were made by the evaluation team. The first was an orientation visit of one-half day per project. This first visit was facilitated by the fact that the MTS Level I evaluation team, Jane Schubert and Tom Parrish of the American Institutes for Research (AIR), had to fly to Los Angeles anyway for a meeting with the local research teams for each project. They were able to add-on this initial visit to three of the six sites to this trip, and the other three sites are within local driving distance of AIR, which is located in Palo Alto.

As the Level I MTS project was new to the research team, this orientation visit was invaluable. It allowed them to obtain an overview of the project as a whole as well as visualize the considerable diversity across sites, as described above. For the most part, this visit was comprised of a short overview presentation by the project director and brief visits to each of the project schools.

The second trip to each site was the formal data collection visit. A common time schedule was followed for each project and a half-day was generally scheduled with the project leadership plus a half-day for each project school. Thus, one day was scheduled for the project with one school, two days for the projects with two or three schools, and three days for the projects with four schools.

The half-day with the district leadership included a two hour interview with the project director and one hour with a higher-level district administrator overseeing the implementation of the project. This latter administrator was to be someone with a broader view of how the project fit into the district's overall technology plan and curricular efforts. An interview protocol showing the topics covered during these, and other interviews, is included with this report as Appendix C.

A uniform schedule was, for the most part, also followed at each school site. This included an hour-long interview with the site coordinator, a one-half hour interview with the principal, a one-half hour tour of the school site, and one hour conducting interviews with six teachers. The two site visitors split up for these teacher interviews so that each interviewed three teachers during this hour. The preferred format for these interviews was an hour-long session with all three teachers present. This was not always possible due to scheduling problems; for example, when two substitutes were used to fill in for all six of these six teachers, we had to see them two at a time. Therefore, at some sites, a series of twenty minute interviews were held. The teachers to be interviewed were selected by school officials. The only requirement was that three be relatively long-term members of the model technology project at the school and three be non-members or fairly new members. Non-members were selected at schools in which all of the teachers were not participating in the project. At schools where all faculty were in the project, new entrants were selected for three of the interview slots. These new entrants might be from one of the later cohorts joining the project or from new teachers to the school. The topics covered during these site-level interviews are also included in Appendix C.

An extensive self-assessment inventory was also sent to each site as the third component of data collection for this project. Some of the pages in these inventories were to be completed by the project leadership team, some by the site-level leadership team at each of the project schools, and some by the local research team. This inventory was constructed following a sequence of topics that have largely been held common throughout this evaluation and in the other components of the overall Education Technology Local Assistance Program. These include:

- Project Background
- Planning and Restructuring
- Content
- Program Implementation
- Support Resources
- Funding Support
- Outcomes
- Recommendations

Within this Level I evaluation, this same topical outline is followed in the interview protocols as contained in Appendix C, and in the write-ups for each of the six project sites, which are included in this volume as Chapters IV through IX.

For the most part, each project reported exerting an extensive, project-wide effort to complete these self-assessment inventories. The basic inventory instrument was 30 pages long and because many of the pages were to be completed for each school site, the completed inventories were up to fifty to sixty pages in length. In addition to the demands of the local evaluators for each project and this system-wide evaluation, the project directors also had demands from the CDE. Thus, when a meeting was held in Sacramento to discuss the need for and the structure of the inventory, some initial resistance was expressed by the project directors. These pressures were somewhat ameliorated, however, when it was agreed at this meeting that the completed inventory, with the addition of a few additional pages, could also meet the requirement for an End-of-Year Report to the CDE for each project. During this meeting, every question on the inventory was carefully reviewed by the project directors and this self-assessment instrument was significantly improved through this process.

A great deal of the material to be presented in Chapters IV through IX for the projects has been taken from these self-assessment inventories. Although the completion of these inventories required fairly extensive efforts on the part of project staff, we believe that this effort was warranted on several counts. First, it provided an opportunity for staff, project-wide, to assess where they were, where they had been, and where they wanted to go for the remainder of the project. In retrospect, some project directors reported this collaborative exercise to have been quite useful. Second, it was the first time that an extensive, common, self-assessment format of this type had been used across all six MTS Level I projects. After the fourth year into the project, this was the first opportunity to view all six projects based on common criteria at the same point in time. Last, it brought a more specific format and structure to, and simultaneously met the needs of, the End-of-Year Report.

The fact that the completion of this inventory could also meet the needs of this required state report was somewhat of an afterthought that resulted from this statewide meeting to discuss the inventory. To ensure more efficient project implementation and processes for accountability in future projects, it is recommended that the best possible integration and coordination of the needs for statewide reporting, project-wide assessment, and local evaluation be considered at the onset. This will ensure the production of more meaningful and useful data and will reduce the burden on local officials, who need to preserve as many resources as possible for project implementation.

Teacher, visitor and student surveys comprise the fourth, and final, component of the data collection process for this study. Copies of each survey are contained in Appendix A and the results from each instrument are in Appendix B.

The teacher survey was forwarded to each project school prior to the site visit to be distributed to all faculty at the school. It begins with some demographic information concerning grades taught, primary subjects, and years of teaching. It then asks questions about project participation. Are they in the project? If not, why not? Would they like to be in the project? It then covers questions about the amount and types of training received and amounts and the use of various types of equipment in their classes. The survey concludes with a section on outcomes. Have they produced products or procedures that they have shared with others? How useful have they found technology to be and in what areas? Out of a total of 1,090 teachers across all project schools 571 returned surveys for a total of 52.4%. Rates of return by project and school are reported in Chapter X.

The uniform visitor's survey, to be used in conjunction with this evaluation, was sent to each of the projects on January 18th, 1991. Soon thereafter, this survey was to be used by all projects to obtain feedback from their technology visitors through the end of the 1990/91 school year. The visitor's survey is divided into three main sections: background, on-site, and follow-up. The background section asks the reason for the visit, the source of information for the MTS project, how their visit was funded, any advance materials supplied by the visited site, and their expectations for the visit. The on site section inquires as to whether their expectations were fulfilled through the visit, how their time was used during the visit, and for recommendations. The concluding section, follow-up in your district, asks about specific items of knowledge that the visitor might take back to their district, actions they may take regarding technology implementation at their home site, and whether they would be willing to purchase materials generated from this technology site or would like to receive further mailings from them.

A total of 362 surveys were returned across all six project sites. Rates of return by project are reported in Chapter X.

Student surveys were administered to a sample of students at each project site. There were two levels of surveys, elementary and secondary, with Spanish and English language versions of each. These surveys were administered to all of the students in one of the technology product classes for all six of the teachers selected for the teacher interview, as described above. This produced three sets of student surveys from teachers who were new to technology use, or who were not in the project, and three from experienced technology users, who had been in the project for several years.

Student surveys were forwarded to each project site prior to the site visitation with instructions that they were to be administered prior to this visit and that the completed surveys would be picked up by the site visitors. The elementary surveys were designed for use in grades 3 - 6 and the secondary surveys for grades 7 - 12. In the case where a teacher was selected for interview from a grade lower than grade 3, the survey was to be administered to a substitute class with a teacher at about the same level of technology expertise as the teacher being interviewed. Each student could choose between the English and Spanish versions of the survey.

The student surveys were designed to reveal students' attitudes about computer use and their opinion as to whether various types of technology were useful in improving learning. They covered the types of equipment students used, the equipment they liked to use best, what technology items they thought most contributed to learning, and the extent to which they had access to educational technology (e.g., educational television and computers) at home. The overall results from these student survey instruments are presented in Appendix B.

V. Conclusion

Had we been able to design this study at the onset of the project, it would have called for improved articulation between the project-related data requirements of the CDE, the project-wide evaluation, and the local evaluation levels. Unfortunately, this was not the case and a considerable body of separate, and often overlapping, instrumentation had to be developed for this evaluation. An extensive survey of the prior evaluation work done on each project revealed little in common across the six sites that would be adequate to meet the needs of the type of comprehensive, system-wide assessment called for in this project. As mentioned above, this same conclusion was drawn by Stetcher in his 1989 assessment of the overall Level I project. For future projects of this type, it is recommended that these diverse data requirements be considered in advance and integrated and coordinated to the greatest extent possible.

Chapter IV
Alhambra Model Technology Schools Project

The data sources used to evaluate the six Level I Model Technology Schools Project include:

- the *Level I Project Self-Assessment Inventory*
- self-administered surveys for students, MTS staff, and site staff
- personal interviews conducted on site with district administrators, MTS staff, principals, site coordinators, and teachers (a total of 34 people)

A summary of the findings are presented below.

I. Background Information

A. Project Background

Through collaboration with Pepperdine University, Alhambra submitted its proposal for the Level I Grant. As a result of this cooperation, Alhambra became one of the two original recipients of the Model Technology award. Training for the project began immediately after receipt of the grant. Alhambra was able to acquire equipment and other resources from private vendors early in the project.

The two schools participating in the MTS project are Emery Park Elementary (which serves grades K-8) and Alhambra High School (which includes grades 9-12).

B. Project Site Demographics

The 1990-91 district enrollment is 20,313. Ethnicity of elementary level students within the district consist of 46.6% Asians, 37.96% Hispanics, 14.36% Caucasians, 1.02% Blacks and .20% Native Americans. Ethnic composition of high school students in the district is comprised of 51.02% Asians, 38.15% Hispanics, 10.16% Caucasians, .84% Blacks and .12% Native Americans.

Emery Park Elementary School serves grades K-8. The 1990-91 school enrollment was 583, which was comprised of 64% Hispanics, 21% Asians, 12% Caucasians, 1% Blacks and .5% Native Americans. Of those 583 students, 182 were Limited English Proficient. A majority of the staff (43) was designated as being actively involved in the project. Only one aide was indicated as being indirectly involved in the project. In addition 280 parents were designated as being actively involved in the project. As for technology use prior to the MTS project, the school had 16 Apple IIes which were seldom used.

Alhambra High School serves grade 9-12. School enrollment for the 1990-91 school year was 3,392 which was comprised of 55% Asians, 34% Hispanics, 10% Caucasians, 1% Blacks and .2% Native Americans. Of those 3,392 students, 1,107 were designated as Limited English Proficient; while 1,315 were eligible for Chapter I services. The majority of participation in the project came from school administrators, site coordinators and teachers. Of the school administrators two were actively involved and four were indirectly involved.

Over half of the teachers were actively involved (70 out of 140), and an additional 20 were indirectly involved. Aides and clerical staff were for the most part likely to be indirectly involved or had no involvement in the project. As for technology use prior to the MTS project, the Business Education and Industrial Tech departments had computers as an essential component of their curriculum. In the Math, English and Consumer Family Living departments, Apple computers have been used for computer assisted instruction. In addition, the central offices and the communications department have had access to technological equipment (i.e., computers, video recording equipment).

The school demographics for the Alhambra project are summarized in Exhibit IV-1.

Exhibit IV-1

Alhambra Project - School Level Demographics		
	Emery Park Elementary	Alhambra High
Enrollment	583	3,392
Grade Levels	K-8	9-12
Percent Minority	87.1%	89.7%
Percent Chapter 1	0%	38.8%
Percent LEP	31.2%	32.6%

C. Project Description

Development of the plan for Alhambra was based on a "student-centered" approach. This approach stresses the student's active involvement in making decisions related to learning. By using technology as a tool, students decide what will be learned, how it will be learned, and how evaluation will occur.

Project participation by type of staff is summarized for each school in Exhibit IV-2.

Exhibit IV-2

Total Staff Reporting Active Project Involvement by School*
and Active Participants as a Percent of Total Staff

	Emery Park Elementary	Alhambra High
School Administrators	1 (100%)	2 (33.3%)
Site Coordinators	6 (100%)	1 (25%)
Teachers	15 (100%)	70 (50%)
Aides	17 (94.4%)	0
Clerical Staff	3 (100%)	1 (5%)
Parents	280	not available
Other		0

* Active involvement refers to staff who were actively implementing project administrative or instructional components during the Spring of 1991.

II. Planning and Restructuring

Throughout the course of the project, the project schools have functioned in various project activities including proposal development, design of annual site plans, advising on project changes, advocating for the project, monitoring the project and evaluating the project. Overall the schools' plans support the district's plan, even though planning for the project was done differently at each of the sites. At both sites, the technology use plan (TUP) has been written into the original MTS and district plan. However, the elementary school has also written the TUP into the existing School Improvement Plan. In addition, a decentralized approach for planning has been emphasized due to individual needs.

During years 1 and 2 of the project, at Emery Park Elementary, the annual MTS plan was decided upon by the MTS Management Team which is comprised of site coordinators, researchers from Pepperdine University, and the project director. Although teacher input was sought, it was felt that most teachers did not have sufficient expertise to be actively involved in initial project planning.

In year 3 of the project, teachers began to share the position of project coordinator. While in the position of project coordinator, the teacher had one semester to achieve specific goals. Two such goals were the development of a Multi-Media Research Lab and the development of the "Thinkers' Club" for at-risk students. As teachers became more comfortable voicing opinions, they decided to replace the position of site coordinator with six teacher facilitators.

With the introduction of teacher facilitators in year 4, grade-level budgets were allocated directly to teachers who were given the responsibility to coordinate staff in-service for their groups. In addition, grade-level goals and objectives were developed to demonstrate when and how specific pieces of software were to be introduced at various grade levels. This type of operation has allowed teachers to meet with the project facilitators to decide what equipment and software they want to purchase.

Students have also had input on planning. They plan and conduct Open House activities for demonstrating software programs to parents. In addition, they review, evaluate, and recommend software packages (e.g., Carmen San Diego, Cheap Paint) for purchase. Not only do they recommend software for purchase, but they also recommend the purchase of computers such as the Macintosh.

At Alhambra High School, work on the annual MTS plan occurs every spring. The project officer, the MTS district director, and the MTS site staff meet to determine what needs to be achieved and what should be the focus for the following year. When planning for the following year takes place, the allotted budget and the original proposal are taken into consideration. After this initial meeting, the site staff meet with the cadre of project teachers to receive any additional suggestions. The plan for the year is finally formalized when the district director, management team and site staff meet for the final time.

Technology is integrated into the curriculum on the basis of content and state frameworks. In turn, instructional and learning strategies are being enriched with the availability of technology. Alhambra High School has also incorporated other technology related planning activities such as Chapter 1, ROP, district in-services, Industrial Technology and District Professional Developmental Grants. Chapter 1 and ROP provide additional support for incorporating technology into the curriculum. District in-services use the MTS "Writing Across the Curriculum" lab to inform and assist teachers. In addition, the Industrial Technology Department offers classes ranging from beginning electronics to drafting for students. The MTS teacher has also received other grant funding that have given further support to the integration of technology into curriculum areas.

Data concerning the frequency of meeting, functions by project year and membership for the project planning committees at each site are presented in Exhibit IV-3.

Exhibit IV-3

Project Technology Planning Committees		
	Emery Park Elementary	Alhambra High
Frequency of Meetings	Bi-monthly	Bi-monthly
Functions by Project Year		
	Emery Park Elementary	Alhambra High
Orig. Proposal Development	Year 1	Year 1 and 2
Design of Annual Site Plan	Year 1-4	Year 2-4
Advising on Project Changes	Year 1-4	Year 2-4
Advocating for the Project	Year 1-4	Year 2-4
Monitoring the Project	Year 1-4	Year 2-4
Evaluating the Project	Year 1-4	Year 2-4
Other: Budget	Year 1-4	
Other: Inservice New Teachers	Year 3 and 4	
Other: Dissemination		Year 3 and 4
Membership		
	Emery Park Elementary	Alhambra High
Administration/Support Staff	10	5
Teachers	19	66
Aides	17	4
Parents	280	30

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III. Content

A. Curriculum

Curriculum and content emphasis of the project summarized by school in Exhibit IV-4.

Exhibit IV-4

Curricular and Process Emphasis of Project by Site		
Curricular Emphasis	Emery Park Elementary	Alhambra High
English/Language Arts	+	+
History-Social Science	+	+
Mathematics	+	+
Science	-	+
Foreign Language	-	+
Visual and Performing Arts	-	+
Health Education	-	+
Physical Education		
Vocational Education		+
Other: ESL		+
Content Emphasis		
Critical Thinking	+	+
Cooperative Learning	+	+
Study Skills	+	-
Self-esteem	+	
Interest/Attitude	+	+
Other: Student Centeredness	+	+

+ = Major Emphasis - = Secondary Emphasis
Blank = No Emphasis

B. Staff Development

A total of 80 training hours were provided to 114 teachers, 117 aides, 1 administrator, 4 clerical staff members, 100 parents and 100 student tutors at the elementary site. At the high school site, 342 hours of training have been provided to 1,333 teachers, 13 administrators, 6 clerical staff members and 345 student tutors. Generally, the training sessions have addressed basic orientation/introduction, instructional applications and classroom management techniques emphasizing cooperative learning and "student-centeredness." At least 77% of the training has been provided by project staff. Levels of staff involvement and training topics are summarized in Exhibit IV-5.

Exhibit IV-5

Project Related Training 1989/90 and 1990/91* Years Total Training Hours = 4,225	
Type of Participant	**Number of Participants**
Teachers	1,447
Aides	117
Administrators	14
Clerical	10
Parents	100
Topics for Training	**Degree of Emphasis**
Basic Orientation/Introduction	Major Emphasis
Instructional Applications	Major Emphasis
Classroom Management	Major Emphasis
Office Administration	Secondary Emphasis

* Only includes training on through March of 1991

One of the special characteristics of this project is that it has taken a "student-centered" approach towards the informal and formal training of teachers. By using this approach, the project site has defined staff development as being based on these notions:

- needs assessments through which teachers self-assess
- curriculum projects, modules, and units, that teachers use to self-direct their growth in integrating technology into the curriculum, and
- a spirit of openness allowing teachers to self-pace their growth.

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Other characteristics of formal training which have been helpful are providing the teacher with a home computer so that new software can be previewed and learned; training on cooperative learning strategies; and support received from Pepperdine University in the areas of training and curriculum.

The student-centered approach has been instituted differently at each of the project schools. The elementary school has chosen "a free-flowing open culture," which allows the teacher to receive training on an as-needed basis. A site coordinator, student, instructional project aide or a university partner may assist the teacher when he/she needs help. Informal training can come by way of a colleague offering suggestions, which sometimes carries more credibility. Another form of informal training has come from the Kidsnetwork projects. With the use of telecommunications, students are able to communicate with other students while teachers communicate with teachers in other districts, states and countries. This is considered an important opportunity for professional growth.

At the high school, a more structured version of the student-centered approach has been used. Bi-weekly cadre meetings allow for group problem solving sessions, and encourage interdisciplinary collaboration (e.g., a Cadre 1 Health Science teacher explaining how he handles the different ability levels in his class to a new Cadre III teacher). As with the elementary school, the high school has also used telecommunications to promote professional development. This has been done in areas such as advanced placement in social studies, American literature, deaf and hard of hearing, and selected Chapter 1 classes.

Professional development has also occurred through other forms of informal training. One way has been interaction between the Pepperdine research team and the site coordinator, the principal and the facilitator. This provides an excellent opportunity to voice concerns. Another method has been the in-house newsletter, "The Marker," which has been disseminated by this site. Teacher projects which clearly demonstrate student-centered aspects are published so that they may serve as examples for other teachers.

C. Learning Resources Management

Teachers have been put into grade level groups at the elementary site. Taking the curriculum as a whole, each grade level group then manages a unit of learning resources. For instance, the third grade group would manage the "Hello Unit" while the fifth grade group would manage the Acid Rain Unit. The management of learning resources has also been improved by providing access to technology for all students at the elementary school. In this manner, students are provided with greater opportunities for input, and have an equal responsibility for their educational experiences. Development and translation of programs have also provided bilingual students with equal access to technology. Examples of these are "Directions/Direcciones" a simplified version of

LogoWriter for K-2 students and translations of LogoWriter task cards and "Explore-a-Story" software programs for bilingual students.

Before technology resources are purchased, teachers at the elementary site, who have developed specific areas of expertise, are consulted. Teachers gain the expertise by attending technology conferences and subscribing to technology-related magazines, thus allowing them to provide reviews for other teachers. Aside from keeping current on the newest technology, teachers are also able to choose appropriate materials for grade levels by attending grade level meetings. At these meetings, teachers brainstorm on the use of technology for a specific grade level, then decisions are made regarding the purchase of hardware or software. For large budget expenditures (i.e., camcorders, computers), discussions occur among the grade level groups and the entire faculty. Once a vote has been reached by the faculty, the lead facilitator reviews and signs all purchase orders for the site. If there are no concerns regarding the purchase of materials after review, the project director signs the purchase order.

At the high school, management of learning resources is under the direction of five cadre members. Data bases have been created to keep track of all the resources available to teachers and students. Furthermore, equipment can be checked out over the weekends or during vacations by teachers and students. Labs such as the MACLab are scheduled through a detailed procedure which allows all MTS teachers equal time.

Prior to purchases of technology, cadre meetings are held to introduce and review hardware and software. When interest is shown in a particular item, a follow up meeting is scheduled. The item is finally considered for purchase when there is a cadre meeting consensus. Other methods of introducing and reviewing technology have included vendors by product and in the form of assistance provided by the district director of Instructional Technology.

D. Dissemination

Both schools report that site visits, conference presentations, inservice and weekend conferences have been the most effective approaches for dissemination. Project-wide dissemination activities are summarized in Exhibit IV-6.

E. Evaluation

The district and the Pepperdine research evaluation team originally came together due to mutual interests in the area of technology. The research evaluation team has been involved at every level of project development and implementation (i.e., from the development of the original project proposal to the present time).

During the second and third year of the MTS project, the major finding reported by the research evaluation team pertained to the teacher. It was found that teachers better

Exhibit IV-6

Summary of Dissemination/Marketing Activities for the Alhambra Project			
Total Developed through the Project	In Progress	Ready to Disseminate	Already Disseminated Sold/Donated
Products	22	0	many
Services	2	0	4
Total Activities for Disseminating Information	In-School	In-District	Out-of-District
	459	135	106
Total Visitors to the Project	Years 1 & 2	Year 3	Year 4
	258	463	189

understood their training when instructional strategies, philosophy and technology were incorporated into the training session. Furthermore, teachers need enough time and opportunity to become familiar and comfortable with technology. In addition, it was realized that after the initial training session teachers need support systems that bolster morale and provide technical assistance. By providing an environment which permits and rewards risk-taking and self assessment, teachers are able to develop their own strategies for integrating technology.

Some of the most important research findings and resulting program modifications, as described by the research team for each of the four years of project implementation, are summarized in Exhibit IV-7.

IV. Program Implementation

A. Emery Park Elementary School

A school-wide implementation process was used by the elementary school. The initial design rotated teachers as project coordinator every semester. For the one semester, the newly appointed project coordinator would work to achieve specific project goals such as the development of a "Thinkers' Club" for at risk students. As teachers began to feel more comfortable with the project, they replaced the position of project coordinator with six teacher facilitators. Then, grade-level goals and objectives were developed to ensure the integration of curriculum and technology. Curriculum areas which have been targeted for technology infusion include English/language arts, history-social science and mathematics. Furthermore, emphasis has been placed on increasing student-centeredness, critical thinking, cooperative learning, study skills, self-esteem and interest/attitude. Approximately 95% of the technology available has been funded by the project, with another 25% donated by Apple computers.

Exhibit IV-7

Research Findings by Evaluation Team and Program Modifications by Year		
Year	**Finding**	**Program Modification**
1	Most crucial element of technology integration is time for staff development and installation of hardware and software (retrofitting, etc.)	Much of the first year was devoted to site preparation so that teachers and students could get easy access to equipment for instruction and for staff development. A great deal of time was consumed by paperwork and phone calls to establish partnerships, fix problems, track orders, order additional equipment, schedule work orders in appropriate sequence, monitor installation of equipment by district personnel.
2	Teachers make better sense of technology (and greater gains in its instructional use) when technology training includes instructional emphasis with a philosophical base.	Where the first year of elementary school training focused on equipment, the high school summer training program focused their first year on instructional strategies and philosophy as well as technology. Formative feedback to project staff about teacher support and staff development activities.
3	Installation problems continues after the initial set-up. Enthusiasm grows in direct proportion to comfort and ease with technology. Teachers are the best support system for teachers. At the point of transition from one stage or level of functioning to another, there is great confusion, uncertainty, and perceived lack of direction.	Business partnerships require a great deal of time and energy to be effective. Teachers need time and opportunity to reflect, discover, observe, and discuss. Funds shifted from acquisition to release time and other opportunities for these processes to occur. Teachers had access to other project funds in the district that augmented and encouraged cross-curricular approaches for technology integration. Teachers need continued, overt socio-emotional support systems as well as skill and knowledge support systems. Teachers need an environment which permits and rewards risk-taking and self-assessment for exploring new alternative strategies for technology integration.
4	Preliminary findings suggest students are the best support system for students, and an important element of the support system for teachers.	(None were provided.)

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B. Alhambra High School

At the high school, the project was implemented by phasing in three separate cadres of teachers and their classes. Rather than attempting to incorporate the full staff at the onset of the project, an initial cadre of teachers entered at the beginning of the project. These teachers then infused enthusiasm for the project throughout the school and were able to serve as trainers for subsequent cadres of staff. Professional development was necessary for integrating technology into the various areas of the curriculum. Curriculum areas included in the project are ESL, English/language arts, history-social studies, mathematics, science, foreign languages, visual and performing arts, health education and vocational education. Approximately 43% of technology available in the school has been funded by project funds.

Exhibit IV-8 summarizes the emphasis in various types of technology by site.

Exhibit IV-8

Types of Technology Use by Site		
	Emery Park Elementary	Alhambra High
Computers	+	+
Laserdisc/Interactive Video	+	+
Instructional Television (ITV)	+	-
Audio/Video Production	+	+
Satellite downlink for ITV reception/distance learning	-	
LCD Panels, Video Projectors	-	-
CD ROM	-	-
Technology for the handicapped		-
Science Lab Equipment	-	+
Calculators	+	-
Telecommunications	-	-
Music	-	
Other: Multimedia		+

+ = Major Emphasis - = Secondary Emphasis
Blank = No Emphasis

V. Support Resources

School site staff report considerable control in deciding content and managing project technology resources. Overall, few discrepancies were reported between the support needed and the support received by the two school sites. At the elementary site, however, a notable discrepancy was indicated for the California Department of Education. They indicated that a high level of support was needed from the California Department of Education, but was not forthcoming. The majority of support from Business Partners came within two-year spans for each of the sites (elementary years 1 and 2, high school years 2 and 3). Both sites report that high levels of support were needed and received by the school project and district administration.

VI. Funding Support

Exhibit IV-9 summarizes AB1470 technology expenditures by school and for project-related district-level administrative and support activities for the 1989/90 school year. This is followed by Exhibit IV-10 which presents technology expenditures at the project schools and for project-level administration and support for all sources.

Exhibit IV-9

AB1470 Technology Expenditures for 1989/90

	Emery Park Elementary	Alhambra High	District Administration*	TOTAL
Certified Salaries	$54,500 (27.7%)	$111,000 (34.5%)		$165,500 (32%)
Classified Salaries	$18,000 (9.2%)	$17,000 (5.3%)		$35,000 (6.8%)
Employee Benefits	$14,000 (7.1%)	$27,000 (8.4%)		$41,000 (7.7%)
Books & Supplies	$25,000 (12.7%)	$15,000 (4.7%)		$40,000 (7.7%)
Services	$48,900 (25%)	$45,525 (32.9%)		$94,425 (18.2%)
Capital Outlay	$36,000 (18.3%)	$105,775 (32.9%)		$141,775 (27.4%)
TOTAL	$196,400 (100%)	$321,300 (100%)		$517,700 (100%)

*No breakout for district administration was provided.

Exhibit IV-10

Total Technology Expenditures at Project Schools by Source for 1989/90

	Emery Park Elementary	Alhambra High	District Administration	TOTAL
AB1470	$196,400 (100%)	$321,300 (94.6%)	0	$517,700 (83.5%)
District General Funds	0	$18,500 (5.4%)	$45,000 (53.8%)	$63,500 (10.3%)
District Categorical Funds	0	0	0	0
Donations - Estimated Value	0	0	$38,612 (46.2%)	$38,612 (6.2%)
TOTAL	$196,400 (100%)	$339,800 (100%)	$83,612 (100%)	$619,812 (100%)

VII. Outcomes

The Alhambra school district reports many benefits from the MTS project. Such benefits include personal growth, increased awareness of the potential of technology for educational applications (by district administration and parents), increased technological knowledge, equal opportunities for disadvantaged and advantaged students, extra funding, and publicity and marketing opportunities for businesses that have also provided beneficial opportunities for the Alhambra schools.

A. Students

The MTS project has had a positive influence on students. By placing the responsibility on students for their achievement and that of peers, students are spending personal time using the technology available to them. Also, they are more willing to coach peers, parents, teachers and visitors on technology use. Student behavior is summarized in Exhibit IV-11A.

B. Teachers

Within both of the sites, there has been a considerable change in staff behavior. There is a higher degree of discussion regarding curriculum and individual instructional strategies. Furthermore, there is an increase with regards to peer coaching. Teachers report that they are now comfortable in providing help to a new teacher with

Exhibit IV-11A
Student Behavior Outcomes

Student Behaviors	Emery Park Elementary	Alhambra High
Fewer class absences	• ↗	↗
Completion of homework	•• ↗	↗
Participation in extracurricular activities	• ↑	
Completion of extra tasks without being asked	•• ↗	•• ↗
Higher standards of performance	•• ↑	•• ↑
Use on non-class time for computers	• ↑	↑
Use of multi-media	↑	↑

Student Performance Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

technological equipment. At the elementary site, there has also been an increase in grant writing and proposals for donation. Teachers also have been offering translation services in exchange for donated products (e.g., Bradford's "Rosie the Counting Rabbit" and LCSI's Primary LogoWriter). Furthermore, teachers are using Gradebuster Plus and Micrograde to maintain records of students' grades.

At both of the project sites there has been change towards teacher-student discussion, cooperative learning and student-based projects which emphasize content, cognition, and problem solving. Change at the elementary site reflects the shift from a teacher-directed philosophy to a student-centered philosophy. This also holds true for the high school site. At the high school, students are given the opportunity to voice their opinions on project design and evaluation methods.

For the elementary site, technical use has been integrated into every aspect of school life. There has been particular emphasis placed on instructional television, computers, laserdisc, calculators, camcorders and telecommunications. In the case of the high school, technological use has primarily concentrated on content presentation, problem solving applications, word processing, desktop publishing, yearbook production and student newspaper production. In the first year emphasis was primarily placed on computers. However, by the third year, extensive use of multimedia presentations and video taping were reported by teachers and students.

Exhibit IV-11B
Teacher Outcomes

Instructional Method	**Emery Park Elementary**	**Alhambra High**
Direct instruction/Lecturing	••• ↘	••• ↘
Teacher-student discussion	• ↗	•• ↑
Individual instruction	•• –	• ↗
Cooperative learning	• ↑	• ↑
Student-based projects	• ↗	•• ↗
Instructional Emphasis		
Skill-based	••• ↘	••• ↘
Content-based	••• –	•• ↗
Affective domain	•• –	not indicated
Cognitive emphasis	• ↗	not indicated
Problem solving emphasis	• ↗	•• ↗
Technical Emphasis		
ITV	•• ↑	• ↗
Computer	•• ↑	•• ↑
Audio Tape	•• –	•• ↗
Laser disc	↗	↗
Calculator	• ↑	••
Camcorder	↑	• ↑
Telecommunications	↑	↑
Other: Multimedia		↑
Technical Use		
Drill and practice	••• ↑	••• ↘
Presentation of content	• ↑	••• ↗
Application to problem solving	• ↑	• ↗
Word processing	•• ↑	•• ↑
Desktop publishing	↗	↗
Computer aided drafting	–	•• ↗
Yearbook	• ↗	••• ↑
Student newspaper	• ↗	••• ↗

Student Performance Prior To Project:

Blank	= Not Present of Used
•	= Little Presence or Use
••	= Some Presence or Use
•••	= Considerable Presence or Use

Direction of Change During Project:

Blank	= No Basis for Assessing
↓	= Large Decrease
↘	= Some Decrease
–	= No Difference
↗	= Some Increase
↑	= Large Increase

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C. Administrative and Other Staff

Changes in administrators' use of technology have been more evident in the elementary site. Several types of software such as HyperCard stack, Works and MacSchool, have been used for procedures such as accounting, word processing and maintenance of records. Staff at both schools report important gains in interaction among colleagues in terms of sharing resources and instructional ideas, teaming in the initiation of activities and improved morale and increased feelings of collegiality.

Exhibit IV-11C
Administrative and Other Staff Outcomes

ADMINISTRATIVE USE	Emery Park Elementary	Alhambra High
Scheduling Classes	→	•••
Recording Attendance	→	•••
Maintaining Grades	↗	••• ↗
Use of Auto Dialer	→	•••
STAFF BEHAVIOR		
Sharing resources	•• ↗	• ↗
Initiating new activities	•• ↗	• ↗
Cross-talk about educational issues	•• ↗	• ↑
Volunteering personal time training, etc.	•• ↗	↗
Feeling of collegiality	•• ↗	• ↑
Improved morale	• ↗	• ↑
Helping peers	• ↗	• →
Learning together	• ↗	• ↑
Seeking assistance/help	•• →	• ↗
Writing Grants	→	• ↗

Use and Practices Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference

D. Business Partnerships/Parents

The school sites have received tremendous support and equipment from their respective business partners. At the elementary site, business partners have tested software, lead in-services (e.g., LegoLogo), visited the site, rented the facility and participated in district and California Technology Project events. In the case of the high school, the business partners have been quite active in helping plan and implement the project. Support has ranged from providing lap tops to providing free repair of the equipment for the duration of the project. Through their support, an appropriate fit is being established between the business and school agenda. As a result, students are being introduced and trained for the different types of technology they will find in the work place.

As parents learn more about technology from their children, they become increasingly aware and interested in the technology that is being implemented at their children's school. Parents' interaction ranges from volunteer activities to attending orientation meetings (e.g., Tandy Parent Nights). At the 7th and 8th grade level, parents check out computers for home use so that their children can finish classroom assignments efficiently.

VIII. Recommendations/Comments

Through interviews and the completion of the template, staff members reported several recommendations and comments relating to the MTS project. A summary follows:

- The State compromised the districts by revising their original plan to match vendors with projects.

- Site-based management is most effective if the majority of decisions are decided by the entire faculty or those most directly affected by the decision. Teachers were ready to largely control their MTS budgets by the third year of the project.

- Staff development is the single most important part of the project. It should be done in a consistent manner and in a variety of modes, i.e. entire faculty, small group, one on one. During the first year, it was crucial for all members of the faculty. It helped members of the faculty bond and overcome common frustrations by brainstorming solutions to shared problems.

- More in depth use of the "TIC" manuals by faculty members would help. In order to effectively do this, staff in-services during the first two years of the project should include "hands-on" training on the use of these manuals. It is critical to get the on-line TIC materials going on the CTP bulletin board system.

Exhibit IV-11D
Business Partnership and Parent Interaction Outcomes

BUSINESS PARTNERSHIPS	Emery Park Elementary	Alhambra High
Solicitation of businesses to collaborate with school	• ↗	•• ↗
Appropriate fit between business/school agenda	• ↗	•• ↗
Number of business partners	• ↗	↗
Scope of business partnerships	• ↗	↗
Active involvement in project planning	→	• ↗
Active involvement in project implementation	• ↗	↗
PARENT INTERACTION		
Use of parent volunteers	•• →	•• →
Attendance at PTA, etc.	•• →	••
Parent use of technology at home	• ↗	not indicated
Amount of parent/school contact re: instructional matters	••• ↗	•• ↗
Attendance at school events	••• ↗	not indicated

Partnerships and Interaction Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

- It was commonly understood that the MTS projects were awarded their grants for a five year period, yet every year, the projects have had to lobby to obtain the "promised" funding for the following year. Valuable time and energies have been spent on lobbying efforts when they could have been more effectively used on strengthening the project.

- During the project, have "MTS Conferences" to allow key participants to meet and discuss what was going on at the other project sites. Also have visits to other sites in order to share ideas. This could have been accomplished through a telecommunications project (or video pen pals) for teachers and their classes from the various MTS sites.

- Dissemination activities such as a video presentations of teachers and their classes from the various MTS sites should be included. Teacher interviews regarding what they have done with their classes would be informative and enjoyable.

Chapter V
Cupertino-Fremont Model Technology Schools Project

The data sources used to evaluate the six Level I Model Technology Schools Project include:

- the *Level I Project Self-Assessment Inventory*
- self-administered surveys for students, MTS staff, and site staff
- personal interviews conducted on site with district administrators, MTS staff, principals, site coordinators, and teachers (a total of 34 people)

A summary of the findings are presented below.

I. Background Information

A. Project Background

This project is comprised of two school districts: the Cupertino Union school district includes the elementary and middle project schools, while Fremont Union school district serves as the high school partner. The 1990-91 enrollment for the elementary school district is 12,341. The student populace consists of 66% Caucasian, 47% Hispanic, 28% Asian and 2% Black. Within the high school district, enrollment for the 1990-91 school year is 7,755. Almost half of the students are Caucasian, 29% are Asian, 12% are Hispanic, 3% are Black and the remaining 1% are Native Americans.

B. Project Site Demographics

There are three schools participating in the MTS project. They are as follows:

Garden Gate Elementary School serves 446 students, 33 of which are in the preschool program, in grades K-6. Of those 446 students 55% are Caucasian, 26% are Asian, 12% are Hispanic, 5% are Black and 2% are Filipino. In addition, 59 students are served by Chapter 1 services while eight students are limited English proficient. Special education Special Day Class students are also enrolled at this school.

Kennedy Junior High School has 780 students enrolled in grades 6-8. The school is comprised of 64% Caucasians, 32% Asians, 3% Hispanics and an equal proportion of Blacks and Native Americans at 1% each.

Monta Vista High School serves 1,520 students in grades 9-12. The student body is comprised of 58% Caucasians, 35% Asians, 5% Hispanics, 1% Blacks and an equal proportion of Native Americans and Filipinos (.5% each).

The school demographics for the Cupertino-Fremont project are summarized in Exhibit V-1.

Exhibit V-1

Cupertino Fremont Project - School Level Demographics

	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Enrollment	446	780	1,520
Grade Levels	K-6	6-8	9-12
Percent Minority	45%	36%	42%
Percent Chapter 1	13.2%		0%
Percent LEP	1.8%		5.8%

C. Project Description

At this site emphasis is placed on empowering the teachers. By using this teacher centered approach, teachers are able to receive technological training and equipment so that they can incorporate technology into their individual teaching methods. The end result will not only benefit the teacher but will also benefit the students' learning experience.

At Garden Gate Elementary, all levels of staff are active in MTS. This includes school administrators, 19 teachers, ten aides and clerical staff. There are only six aides which are indirectly involved with the project. Prior to the initiation of the project, the school extensively used 14 computers (II, IIe's, C's CommaDore, IBM PC Jrs) as well as an Apple IIe lab with twelve computers.

At Kennedy Junior High, almost all of the staff are actively involved in the MTS project with the exception of two out of 36 teachers and three out of four aides who are indirectly involved. Before MTS, technology was utilized in the Apple IIe lab and by the math department. In the lab, students were taught Basic and Logo Programming. In the math department, students frequently used CTIF funded computers and software to reinforce skills and concepts learned in the classroom.

Out of 73 teachers at Monta Vista High School, four are not involved in the MTS project. The remaining 116 are either actively involved or indirectly involved. Prior to the MTS project, technology (i.e., computers) was utilized by the computer, business, math and science classes. Other forms of technology were used by other departments.

Project participation by type of staff is summarized for each school in Exhibit V-2.

Exhibit V-2

Total Staff Reporting Active Project Involvement by School* and Active Participants as a Percent of Total Staff

	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
School Administrators	1 (100%)	1 (100%)	4 (100%)
Site Coordinators	0	1 (100%)	2 (100%)
Teachers	19 (100%)	34 (94%)	55 (75.3%)
Aides	10 (62.5%)	1 (25%)	4 (57.1%)
Clerical Staff	2 (100%)	3 (100%)	9 (64.3%)
Parents	10	not available	not available
Other	3 (37.5%)		

* Active involvement refers to staff who were actively implementing project administrative or instructional components during the Spring of 1991.

II. Planning and Restructuring

The planning process begins with the Site Management Board in the spring of each year. Members of this board include school administrators, the project director, MTS coordinators and currently the site coordinators from Monta Vista and Kennedy. Each spring, the planning process involves reviewing the present plan for strengths and weaknesses; brainstorming for new ideas and directions; developing major project goals; and allocating site budgets based on project needs. At each of the sites, teachers were introduced into the project by different approaches. The elementary district used a total immersion approach, while the high school district followed a cohort approach.

Each of the schools has a school site technology planning committee which has functioned in many ways: original proposal development, design of annual site plan, advising on project changes, advocating for the project, monitoring the project and evaluating the project. However, there have been a few exceptions. At the high school a department chair serves as a part-time site coordinator.

Overall, the technology use plans were designed to support the district plan. However, at the high school the plans only incorporate some district elements. Teachers design individual Personal Learning Plans (PLPs) which are separate plans developed in conjunction with each participating teacher for the purpose of incorporating technology use in a way that will lend support to the overall department plan. The elementary school has written technology into the MTS and department plans. Additional activities incorporating technology have also been planned for the School Improvement Plan, and Individualized Education Plans. At the middle school technology also has been written into the School Improvement Plan.

Data concerning the frequency of meeting, functions by project year, and membership for the project planning committees at each site are presented in Exhibit V-3.

Exhibit V-3

Project Technology Planning Committees			
	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Frequency of Meetings	Bi-monthly	not indicated	4 times a year
Functions by Project Year			
	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Orig. Proposal Development	Year 1	Year 1	Year 1
Design of Annual Site Plan	Year 1-4	Year 1-4	Year 1-4
Advising on Project Changes	Year 1-4	Year 1-4	Year 1-4
Advocating for the Project	Year 1-4	Year 1-4	Year 1-4
Monitoring the Project	Year 1-4	Year 1-3	Year 1-3
Evaluating the Project	Year 1-4	Year 1-3	Year 1-3
Other: Budget Recommendations	Year 1-4		
Membership			
	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Administration/Support Staff	3	9	12
Teachers	18	36	60
Aides	10	1	4
Parents	10	4	

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III. Content

A. Curriculum

Curriculum and content emphasis of the project are summarized by school in Exhibit V-4.

Exhibit V-4

Curricular and Process Emphasis of Project by Site

Curricular Emphasis	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
English/Language Arts	+	+	+
History-Social Science	+	+	+
Mathematics	+	+	+
Science	+	+	+
Foreign Language		+	+
Visual and Performing Arts	-	+	+
Health Education			+
Physical Education	-	-	+
Vocational Education		+	+
Other: Collegiality			+
Content Emphasis			
Critical Thinking	+	-	+
Cooperative Learning	+	-	-
Study Skills	-	-	-
Self-esteem	+	-	+
Interest/Attitude	+	+	+

+ = Major Emphasis - = Secondary Emphasis Blank = No Emphasis

B. Staff Development

The concept of teachers training fellow teachers has been an integral part of the project. Through first and second cohorts established at the middle and high school, 19 teachers received training, equipment and software to develop technologically enhanced lessons correlated to the state frameworks. These trained teachers shared their experience with other teachers at awareness sessions and summer institutions. By using the cohort approach, teachers were encouraged and rewarded for becoming experts in specific hardware and software, since they would then be able to train and support other teachers. Staff development can also be attributed to Peer Coaching which occurred in the Teacher Productivity Centers. Continued training has also been promoted through the MTS Rover program. Through this program, a substitute will take over the class when an MTS teacher signs up for an individual training session with the site coordinator. Finally, Prep Period Training also provided teachers with the opportunity to train during the work day at the junior and senior high schools.

From 1989 to March of 1990, Cupertino-Fremont MTS provided 1559 hours of training to teachers, clerical aides and administrators. The overall emphasis was placed on instructional applications. Secondary emphasis was given to basic orientation, classroom management and office administration. Over half of the training (78%) was provided by the project staff. Levels of staff involvement and training topics are summarized in Exhibit V-5.

Exhibit V-5

Project Related Training 1989/90 and 1990/91* Years
Total Training Hours = 1,559

Type of Participant	**Number of Participants**
Teachers	not available
Aides	not available
Administrators	not available
Clerical	not available
Parents	not available
Topics for Training	**Degree of Emphasis**
Basic Orientation/Introduction	Secondary Emphasis
Instructional Applications	Major Emphasis
Classroom Management	Secondary Emphasis
Office Administration	Secondary Emphasis

* Only includes training on through March of 1991

C. Learning Resources Management

The site budget is managed by departments which allocate or administer funds based on review and authorization of individual teacher plans. Through the PLP/DTP and Preview Purchase processes, teachers have had a direct involvement in the purchase of resources. As a result, teacher ownership of materials has increased. Teachers submit a Preview Purchase form to their department in order to review technology-based learning resources. At this point, the form is reviewed and authorized by the principal. This method has lead to the development of local inventories and an increase in teachers' accountability for hardware and software.

D. Dissemination

Project-wide dissemination activities are summarized in Exhibit V-6.

Exhibit V-6

Summary of Dissemination/Marketing Activities for the Cupertino-Fremont Project			
Total Developed through Project	In Progress	Ready to Disseminate	Already Disseminated Sold/Donated
Products	23	4	53
Services	0	0	6
Total Activities for Disseminating Information	In-School	In-District	Out-of-District
	262	77	204
Total Visitors to the Project	Years 1 & 2	Year 3	Year 4
	165	466	235

E. Evaluation

SRI was selected by the project leadership to conduct the evaluation of the Cupertino-Fremont MTS. The evaluation team is comprised of Dr. Marian Sterns, Dr. Steve Schneider and Dr. Susan Hanson. In addition to serving as a participant and observer for the site management board (SMB), the research and evaluation coordinator met with project staff to begin operation of SMB decisions. The primary research objectives of the team were to gather information on the project's progress; provide descriptive material on the Teacher-Centered Model of Technology Integration; provide information on barriers and facilitator; and provide guidance on critical components, mechanisms, contextual conditions and activities. The final objective was to aid state policymakers' understanding regarding the improvement of education through technology use.

The findings which occurred in the first three years placed an important emphasis on the teacher's role. During the first year it was determined that training should be tailored to commonalities among teachers. Furthermore, support should be offered through technical assistance, release time for learning, or through technology-assisted lessons. As a result, Personal Learning Plans (PLPs) were designed.

Once teachers became more comfortable with technology, the next step was to allow teachers discretion over software budgets. Departmental Technology Planning is used for equipment resource allocation at the elementary and middle schools. This process grants each of the departments at the schools discretion to determine how their technology budget will be used to best meet local goals and objectives. This increased involvement provided an incentive for teachers to learn new technologies and employ them in class.

Some of the most important research findings and resulting program modifications, as described by the research team, are summarized in Exhibit V-7.

IV. Program Implementation

The teacher has been the primary focus during the implementation of the MTS program. The resulting teacher-centered approach required technological training for teachers and allowed teachers to prepare individual plans which incorporated the use of technology. Teacher training usually begins with one piece of equipment, so that they may feel comfortable and feel they can use it effectively as an instructional tool. The PLPs provide the teacher with a guide for incorporating technology and instruction. In addition, it provides an overall support to the departmental plan. This method also allows the teacher to have an active part in deciding and managing resources from the project.

Based on the needs of individual teachers and departmental plans, project schools implemented the project differently.

A. Garden Gate Elementary School

This school has focused on such issues as general technology use, technology in the curriculum, professional development and at-risk students. All classrooms have at least one computer, 50% of which have been funded by the project. Other emphasis is placed on such technological equipment as laserdisc/interactive video, instructional television, audio/video production, technology for the handicapped, and calculators. By infusing technology into the English/language arts, history-social science, math, science and health education curricula, teachers will increase students' critical thinking and cooperative learning skills. The "rover" program used at the elementary school provides teachers with technical assistance opportunities during the school day. When teachers

Exhibit V-7

Research Findings by Evaluation Team and Program Modifications by Year

Year	Finding	Program Modification
1	Training "courses" and orientation/demonstrations will work only for a few and only for a while; a better scheme is to find some commonalities among a group of teachers for which "training" can be tailored more; also find a way to support individual teachers with technical assistance and release time to learn what they seek/need to learn next, or put together their technology-assisted lessons.	Project managers and coordinators devised Personal Learning Plans (PLPs). A variety of training, demonstrations, hands-on help and mini-workshops were provided. In addition, more release time, substitutes, course crediting, and registration fees for enrollment in courses were provided.
2	The whole school faculty (or most of it) will "buy into" using technology if their professional purposes for use are taken seriously, they have some say or control over what is purchased for their use (hardware and software); they have some appropriate support for learning what they need to know (not added-on obligations to attend events); they are rewarded and recognized when they demonstrate growth in technology use.	Individuals or groups of teachers were given discretion over software budgets; Departmental Technology Planning became the mode for helping to decide on the equipment resource allocation scheme; each school site administrator came up with ways to encourage teachers' to learn how to use technologies and employ them in class (e.g., mini-grants); making "stars" of teachers who use technology and demonstrate uses for their peers.
3	Teachers who use new technologies and incorporate them into instruction don't necessarily change their teaching styles. Thus the introduction of technology does not necessarily increase higher-order thinking, if teachers are still using their old techniques for instruction.	Planning by the project managers included training of coordinating staff as well as training and support for the teachers themselves in techniques for instruction that elicit higher-order thinking in students. Project staff are more aware of software or technological tools that enhance higher-order thinking and a new level of "incorporating the California curriculum frameworks" is occurring.
4	There is a need to begin evaluating visits and investigating what works best in disseminating to other schools and districts. What is effective in actually changing their behavior.	We expect to affect the Adoption/Adaption guide currently being prepared. The staffing for the project in Year 5 will need to enhance the payoff of visits to Cupertino-Fremont. There will need to be conference presentations by school site managers and project staff. We will also need to identify the nature of other dissemination and training activities.

sign up for assistance from the project site coordinator, a "rover" substitute is made available to work in their regularly scheduled class. In addition to formal training from the coordinator, a lot of informal coaching takes place between school staff.

B. Kennedy Junior High School

This school used a series of teacher cohorts to implement the project. During the first year teachers with no technical background had difficulty because there was no one on-site and no formal training. As best they could, teachers provided assistance to one another until a site coordinator was found and formal training provided. An incident which captures the situation at Kennedy Junior High School is the National Geographic GTV curriculum pilot test that was conducted in a social studies class. During the two month testing period, a representative from the developer worked with the teacher. At the end, both the teacher and the students collaborated to critique the materials. They were pleased when their suggestions appeared in the final product. Since then, the teacher has received a free set of materials and is urging the school to purchase additional copies. In addition, participation in this pilot test has led the teacher to consider other materials developed by National Geographic such as the "archive program." Other technology such as computers, instructional television, audio/video equipment, and calculators are integrated in various areas of the curriculum. One hundred percent of the classrooms contain at least one computer. Approximately 40% of the technology found in the school has been funded by the project.

C. Monta Vista High School

This school also used teacher cohorts to implement the program. Approximately 50% of the technology in the school has been funded by the project. Technology has been infused into all areas of curriculum.

Exhibit V-8 summarizes the emphasis in various types of technology by site.

V. Support Resources

At each project site, the teacher-centered approach has given the teachers a participatory role over content and management of resources. By following the departmental guidelines, teachers design PLPs to demonstrate how technology is being infused with instruction in their classrooms. In addition, a Purchase/Preview Form for equipment or software is completed by the teacher and turned into the department for authorization. Since each department manages their own project budget, they determine how the funds will be allocated and administered.

Between the three project schools, few discrepancies have been noted between the support needed and that actually received. Among the school, project and district

Exhibit V-8

Types of Technology Use by Site

	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Computers	+	+	+
Laserdisc/Interactive Video	+	-	-
Instructional Television (ITV)	+	+	-
Audio/Video Production	+	+	+
Satellite downlink for ITV reception/distance learning			
LCD Panels, Video Projectors	-	-	+
CD ROM	-	-	-
Technology for the handicapped	+		-
Science Lab Equipment	-	-	+
Calculators	+	+	-
Telecommunications	-		
Music	-	-	+
Other: Commercial Instructional Video			+

+ = Major Emphasis - = Secondary Emphasis blank = No

Emphasisadministration there have been minor shifts between support needed and actual support received. The schools have noted that all three levels of administration (i.e., project, school, district) have provided excellent cooperation.

Notable discrepancies were indicated for the California Department of Education, the California Technology Project, and business partners across all three project schools. Project staff indicate that, the State Department of Education has been only minimally visible and has not set clear expectations. In order to improve the situation, better methods are needed to present clear guidelines to the schools. A consensus is also reported among the three schools regarding the minimal visibility and support provided by the California Technology Project. The project schools are unaware of its mission and thus call for improved communication and dissemination efforts. Support from business partners is also reported as somewhat less than needed.

VI. Funding Support

Exhibit V-9 summarizes AB1470 technology expenditures by school and for project-related district-level administrative and support activities for the 1989/90 school year. This is followed by Exhibit V-10 which presents technology expenditures at the projects schools and for project level administration and support from all sources.

VII. Outcomes

The Cupertino-Fremont project reports some important benefits from the MTS project. These are summarized below.

A. Students

Students are reported to be setting higher standards of performance for themselves, completing extra tasks without being asked, using non-class time for the computers, using multi-media and participating in extracurricular activities. Teachers serve as role models when students see them using the latest technology. As a result, students begin to use the technology to present their work and ideas in a variety of ways, such as students at the middle school who are using camcorders to produce plays, skits and video magazine articles.

B. Teachers

The use of the staff development model (using teachers to train teachers) has led to an overall increase in areas such as collegiality, peer assistance, and cooperative learning. Teachers work as a group focusing on technology and its relationship to the instructional framework. In the process, they have to solve problems and provide assistance in the use of equipment and software. In the case of the high school, a district-wide Inservice Day was developed so that teachers could share their knowledge and uses for technology with other high schools in the district. As teachers become more comfortable with the technology available to them, they report increased use of technology and more sophisticated lessons.

Overall, the project schools report improvements in instructional methods and in the use technology. For example, one school notes that the project provided the environment to facilitate change. Overall, a substantial increase in the use of individual instruction, cooperative learning and student-based projects as instructional methods were reported. Direct instruction/lecturing showed some decrease in all three schools. The elementary and junior high school noted a substantial increase in problem solving. For the high school, an increased emphasis was placed on cognition.

Exhibit V-9

AB1470 Technology Expenditures for 1989/90

	Garden Gate Elementary	Kennedy Junior High	Monta Vista High	District Administration	TOTAL
Certified Salaries	$1,902 (13.1%)	0	$44,454 (25%)	$5,196 (1.4%)	$51,552 (8%)
Classified Salaries	$5,019 (34%)	$3,692 (14.5%)	0	$76,532 (21.3%)	$85,243 (13.7%)
Employee Benefits	$1,177 (8.1%)	$1,572 (6.2%)	$8,992 (4%)	$12,873 (3.6%)	$24,614 (4%)
Books & Supplies	$5,758 (39.6%)	$3,858 (15.2%)	$20,000 (9%)	$5,782 (1.6%)	$35,398 (6%)
Services	$691 (4.75%)	$7,626 (30.1%)	0	$110,733 (31%)	$119,050 (19.2%)
Capital Outlay	0	$8,582 (34%)	$148,230 (67%)	$147,526 (41.1%)	$304,338 (49.1%)
TOTAL	$14,547 (100%)	$25,330 (100%)	$221,676 (100%)	$358,642 (100%)	$620,195 (100%)

Exhibit V-10

Total Technology Expenditures at Project Schools by Source for 1989/90

	Garden Gate Elementary	Kennedy Junior High	Monta Vista High	District Administration	TOTAL
AB1470	$14,547 (46.5%)	$25,332 (76%)	$221,676 (63.6%)	$358,642 (55.8%)	$620,197 (58.5%
District General Funds	43 (.1%)	0	$95,496 (27.4%)	$1,154 (.2%)	$96,693 (9.1%)
District Categorical Funds	$16,692 (53.4%)	$7,984 (24%)	0	$20,340 (3.2%)	$45,016 (4.3%)
Donations - Estimated Value	0	0	$31,191 (9%)	$262,078 (40.8%)	$293,269 (27.8%)
TOTAL	$31,282 (100%)	$33,316 (100%)	$348,363 (100%)	$642,214 (100%)	$1,055,175 (100%)

Exhibit V-11A
Student Behavior Outcomes

Student Behaviors	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Fewer class absences	*** →	* →	*** →
Completion of homework	*** →	*** →	*** →
Participation in extracurricular activities	*** →	*** ↗	*** →
Completion of extra tasks without being asked	*** →	** →	** ↗
Higher standards of performance	*** →	*** ↗	*** ↗
Use on non-class time for computers	*** ↗	** ↑	* ↑
Use of multi-media	↗	↑	* ↑

Student Performance Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

An increased emphasis was reported for laserdiscs and camcorders at all three schools. In addition, instructional television and computers sustained a growth in emphasis. The emphasis placed on these equipment items lead to substantial use in areas such as content presentation, word processing, desktop publishing and yearbook preparation. Use of technology was also increased for problem solving applications and drill and practice. For the high school, the greatest increase in technical use occurred in year 4 with drill and practice. The teachers were able to make drill and practice an effective instructional technique as they became more aware of the appropriate usage. These outcomes are all summarized in Exhibit V-11B.

C. Administrative and Other Staff

Use of technology among the administrative staff has differed at the project schools. At the elementary and middle school, the use of technology for office tasks (e.g., recording attendance, maintaining grades, producing flyers) has not increased. At the high school the county mainframe had been used for attendance prior to MTS, so technological use in this area has remained constant. However, the high school reports increased school

Exhibit V-11B
Teacher Outcomes

Instructional Method	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Direct instruction. Lecturing	*** ↘	*** ↘	*** ↘
Teacher-student discussion	*** ↗	*** –	*** ↗
Individual instruction	** ↑	* ↗	* ↗
Cooperative learning	* ↗	* ↗	* ↗
Student-based projects	* ↑	*** ↑	** ↗
Instructional Emphasis			
Skill-based	*** –	*** –	*** –
Content-based	*** –	*** ↘	*** –
Affective domain	*** –	** ↑	· * – ↓
Cognitive emphasis	** –	*** ↘	*** –
Problem solving emphasis	** ↗	** ↑	** ↗
Technical Emphasis			
ITV	* ↑	* ↗	** ↗
Computer	* ↑	* ↑	* ↑
Audio Tape	* ↘	* –	** –
Laser disc	↑	↑	↗
Calculator	** –	* –	** ↗
Camcorder	↑	↑	* ↑
Telecommunications	↗	–	–
Technical Use			
Drill and practice	*** ↗	* ↗	* –
Presentation of content	* ↑	↑	* ↑
Application to problem solving	* ↗	* ↗	* ↑
Word processing	↑	↑	* ↑
Desktop publishing	↑	↑	* ↑
Computer aided drafting	–	–	* ↗
Yearbook	↑	↑	* ↑
Student newspaper	–	↑	* ↑

Student Performance Prior To Project:

Blank	= Not Present of Used
*	= Little Presence or Use
**	= Some Presence or Use
***	= Considerable Presence or Use

Direction of Change During Project:

Blank	= No Basis for Assessing
↓	= Large Decrease
↘	= Some Decrease
–	= No Difference
↗	= Some Increase
↑	= Large Increase

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publications due to their enhanced word processing capacity. Staff at all schools report important gains in interaction among colleagues in terms of sharing resources and instructional ideas, teaming in the initiation of activities, improved morale and increased feelings of collegiality.

Exhibit V-11C
Administrative and Other Staff Outcomes

ADMINISTRATIVE USE	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Scheduling Classes	→	*** ↑	*** →
Recording Attendance	*** →	*** →	*** →
Maintaining Grades	* ↗	↑	*** →
Use of Auto Dialer	not indicated	not indicated	*** →
Other: School Publications	*** ↑	** ↑	* ↑
STAFF BEHAVIOR			
Sharing resources	** ↑	** ↑	*** ↗
Initiating new activities	** ↑	**	** ↑
Cross-talk about educational issues	* ↑	** ↑	* ↑
Volunteering personal time training, etc.	* ↑	** ↑	** ↑
Feeling of collegiality	** ↑	** ↑	*** ↑
Improved morale	** ↗	** ↗	** ↑
Helping peers	** ↑	** ↑	*** ↑
Learning together	** ↑	** ↑	** ↑
Seeking assistance/help	** ↑	** ↑	** ↑
Writing Grants	↗	** →	** →

Use and Practices Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

D. Business Partnerships/Parents

During the course of the project there has been a notable increase in the number of businesses providing equipment and software and actively involving themselves in project planning and implementation. For example, the major business partner (Apple Computers) dedicated a full-time employee to work with them for the first three years of the project. In addition, other companies have supplied software. Business partners have learned the benefits of technology-enhanced learning and are eager to invest in the success of this project site.

The most notable increases in parent interaction were reported for the elementary and middle schools. An area which has had considerable increase is parent contact with the school instructional matters. In addition, at the elementary school, the school newsletter is now supplemented by classroom newsletters. In the case of the middle school, videos were created for parent and student orientations to demonstrate school operations and student life on campus. Teachers have also used Micrograde software to inform parents of their student's progress. Another indication of parents' interest in technology has been the increase in technology reported in their homes.

VIII. Recommendations/Comments

Recommendations and comments relating to the MTS projects were provided by Cupertino-Fremont Staff through interviews and completion of the template. A summary follows:

- State evaluation format should be clean and consistent and should reflect a better understanding of school guidelines. State MTS requirements have been reasonable. Where it was necessary, the requirements were modified to meet the needs of each project.

- The role of the Advisory Council and how it can affect the project needs to be clarified. Are they truly advisory or more of a public relations group? Their major role to date has been to suggest project initiatives, and to improve community support.

- Continue to promote the use of school site staff for training across the state. Encourage the State Department of Education to fund training programs for trainers. Promote site visits for project teachers to see other sites and share successes and brainstorm solutions to existing problems.

Exhibit V-11D
Business Partnership and Parent Interaction Outcomes

BUSINESS PARTNERSHIPS	Garden Gate Elementary	Kennedy Junior High	Monta Vista High
Solicitation of businesses to collaborate with school	↑	• →	↗
Appropriate fit between business/school agenda	→	• →	•• ↗
Number of business partners	• ↗	• ↗	↗
Scope of business partnerships	• ↗	• →	→
Active involvement in project planning	↗	→	• ↗
Active involvement in project implementation	↗	→	↗
PARENT INTERACTION			
Use of parent volunteers	••• →	•• →	••• →
Attendance at PTA, etc.	• →	•• →	• →
Parent use of technology at home	• →	•• ↗	••• →
Amount of parent/school contact re: instructional matters	• ↗	••• ↗	•• →
Attendance at school events	•• ↗	••• ↗	••• →

Partnerships and Interaction Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

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- MTS schools should receive drafts of all new frameworks. Learning technology is so time consuming it doesn't automatically mesh with frameworks. All subject area managers from the State Department of Education should meet with project teachers to help them implement new frameworks.
- Provide in-services to project teachers on new frameworks with the emphasis on incorporating technology.
- Provision must be made for longitudinal funding for upgrading and maintaining hardware and software. We can then continue to pilot, train and disseminate "cutting-edge" technologies.
- Promote meetings for training and dissemination activities such as those done by Cupertino-Fremont and Monterey MTS projects.
- The California Technology Project (CTP) needs to help promote advertisement of project activities and product dissemination. Furthermore, help is needed to promote other activities such as the California Writing Project and the Science Project. Promote technology teacher presentations at curriculum based conferences.
- State should provide assistance in developing business partners.

Chapter VI
Los Angeles Model Technology Schools Project

The data sources used to evaluate the six Level I Model Technology Schools Project include:

- the *Level I Project Self-Assessment Inventory*
- self-administered surveys for students, MTS staff, and site staff
- personal interviews conducted on site with district administrators, MTS staff, principals, site coordinators, and teachers (a total of 34 people)

A summary of the findings are presented below.

I. Background Information

A. Project Background

Perhaps the most ambitious of the six projects, the Los Angeles Model Technology Schools Project spans four schools and involves nearly three times as many students as the next largest project. This project was not one of the original recipients of MTS funds; much time was spent lobbying for the grant. Although the grant was awarded in the fall of year 1, funds were not available until January. As a result, no project funds were available for equipment until Spring. The project director emphasized the difficulty of this first year and the resulting slow start for the project.

B. Project Site Demographics

The Los Angeles Unified School District's enrollment for 1990-91 is 625,140. Over half of the students are Hispanic (63.3%), while 15.2% are Black, 13.6% are Caucasian, 5.4% are Asian, 1.8% are Filipinos, 0.4% are Pacific Islanders, and the remaining 0.3% are Native Americans. Within the district over a quarter of the students are eligible for Chapter 1 services, while 34% of the students are limited English proficient.

Corona Elementary School covers grades K-5. A majority of students are Hispanic (94%); of the remainder, 3% are Caucasian, .6% are Native Americans and there is an equal proportion of Asians, Blacks and Filipinos (1% each). Students eligible for Chapter 1 services number 1,426, while 1,191 are limited English proficient.

Loma Vista Elementary School enrolls 1,650 students; the majority of these students are Hispanic (99%) and the remaining 1% are Caucasian. About 77% are eligible for

Chapter 1. Of those students enrolled in the 1990-91 school year, 1,250 were limited English proficient.

Nimitz Junior High School serves 3,660 students, 97% of which are Hispanic, in grades 6-8. Of the 3,660 students enrolled, 3,400 are eligible for Chapter 1 services and 1,600 are limited English proficient.

Bell High School enrolls 3,769 students in grades 9-12. The majority of the students are Hispanic (96.03%), while the remaining student body is comprised of 2.39% Caucasians, .69% Native Americans, .31% Asians, and .26% Blacks. Nine-hundred and fifty-five students are limited English proficient. Although many of the students at Bell are eligible for Chapter 1, none receive such services. About ten years ago, just before Bell High was to become a Chapter 1 school, the federal government switched its delivery of Chapter 1 grants from districts to states. During the next academic year, the state of California did not increase the grant to the Los Angeles Unified School District. To keep the existing Chapter 1 schools at the same funding as the previous year, the district decided not to add any more schools to those already receiving services.
As a result, Bell High did not become a Chapter 1 school.

The school demographics for the Los Angeles project are summarized in Exhibit VI-1.

Exhibit VI-1

Los Angeles Project - School Level Demographics				
	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Enrollment	2,014	1,650	3,660	3,769
Grade Levels	K-5	K-5	6-8	9-12
Percent Minority	97%	99%	100%	97.6%
Percent Chapter 1	70.8%	77.4%	92.9%	0%
Percent LEP	59.1%	75.7%	43.7%	25.3%

C. Project Description

The implementation of MTS at each school has varied considerably. Each site was unique in its prior technology use, the receptivity and stability of the school administration and school-level project administration, and the project phase in which it was implemented. While Corona Elementary School has been fairly successfully implemented from the project inception, Bell High School has just begun its phase-in which will not be completed until May 1992. The other two sites report successful implementation, as well as some significant set-backs, since the beginning of the project.

At Corona Elementary School, the majority of staff are either actively or indirectly involved in MTS: all of three school administrators are actively involved; three out of four site coordinators are active. Of the 79 teachers at Corona, 20 are active as team members; 36 are active as the second level members; while 23 are not involved. Thirty of the 53 aides are active; 11 are indirectly involved; while 12 are not involved. All clerical staff are actively involved. Prior to the MTS project, the availability of technology was limited to a few computers in classrooms. Nonetheless, consistent principal support and increased use of technology by staff were reported.

At Loma Vista Elementary School, approximately half (31 out of 65) of the teachers are actively involved. The remaining teachers (34) and clerical staff (6) have no involvement in the MTS project. One site coordinator is actively involved. The other two site coordinators are somewhat involved. All three school administrators and 31 aides are indirectly involved. Due to the successful lobbying of the former principal and his strong advocacy of technology, Loma Vista became an MTS school. The current principal has been supportive of the project although somewhat less involved.

Prior to MTS, Nimitz Junior High School had been a technologically oriented school. Computers are found in the computer science classrooms, the special education department and the gifted education department. In addition, services provided by Chapter 1 included the use of CAI in reading and math labs. Currently the majority of the staff are not involved in the MTS project. Only 25 staff members from a total of 177 are actively involved -- two school administrators, one site coordinator, 22 teachers and one aide. The remaining staff members -- one school administrator and five coordinators -- are indirectly involved with the project. The principal who has been at this site since the beginning of MTS, is a strong advocate of the concept of educational technology. Nimitz also profited from its MTS experience to write and receive a major IBM grant to serve additional non-MTS teachers.

Before MTS was initiated, Bell High School's technology was limited to a MAClab, an Apple lab and one television production class. Of those participating in the project, one school administrator, one site coordinator and 10 teachers are actively involved. These ten teachers represent only about 6.5% of the total faculty at Bell. An additional 20 teachers are indirectly involved in the project. The former principal, who was an original designer of the project proposal, was a strong advocate of technology in education. The present principal is less directly involved but supports the concept of technology use in education. Because of the implementation schedule adopted by the district, the high school was the last site to be phased in; the 1990/91 school year was its first full year of operation.

Project participation by type of staff is summarized for each school in Exhibit VI-2.

Exhibit VI-2

Total Staff Reporting Active Project Involvement by School[*] and Active Participants as a Percent of Total Staff

	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
School Administrators	3 (100%)	0	2 (40%)	1 (25%)
Site Coordinators	3 (75%)	1 (33%)	1 (20%)	1 (25%)
Teachers	56 (70.9%)	31 (47%)	22 (14.7%)	10 (6.5%)
Aides	30 (56.6%)	31 (62%)	1 (2.8%)	not given
Clerical Staff	7 (100%)	0	0	not given
Parents	60	3	not available	not available
Other	1 (50%)			

[*] Active involvement refers to staff who actively implemented project administrative or instructional components during the Spring of 1991.

II. Planning and Restructuring

Two (Corona and Nimitz) of the four schools have a school-site technology planning committee. Since year 1 of the project, the committees have been actively involved in many ways: original proposal development; design of annual site plan; advising on project changes (except Nimitz); advocating for the project (except Nimitz); monitoring the project; and project evaluation (except Nimitz). At Corona, technology was written into the existing School Improvement Plan. A separate technology plan was developed for the other elementary and middle school. At least three of the schools show support of the district plan whether it follows indirectly or only incorporates some planning elements.

Data concerning the frequency of meeting, functions by project year, and membership for the project planning committees at each site are presented in Exhibit VI-3.

Exhibit VI-3

Project Technology Planning Committees				
	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Frequency of Meetings	Bi-monthly	As needed	As needed	not indicated
Functions by Project Year				
	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Orig. Proposal Development	Year 1	Year 1	Year 1	Year 1
Design of Annual Site Plan	Year 1-4	Year 1-4	Year 2	Year 3
Advising on Project Changes	Year 1-4	Year 4	Year 2-3	Year 3
Advocating for the Project	Year 1-4	not indicated	Year 2-4	Year 1-4
Monitoring the Project	Year 1-4	not indicated	Year 3-4	not indicated
Evaluating the Project	Year 2-4	not indicated	Year 3	Year 4
Membership				
	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Administration/Support Staff	14	4	3	2
Teachers	56	31	22	30
Aides	30	31	1	0
Parents	671	3	not indicated	0

III. Content

A. Curriculum

Curriculum and content emphasis of the project are summarized by school in Exhibit VI-4.

Exhibit VI-4

Curricular and Process Emphasis of Project by Site

Curricular Emphasis	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
English/Language Arts	+	+	+	+
History-Social Science	+	+	+	
Mathematics	+	-	-	
Science	+	+	+	
Foreign Language				
Visual and Performing Arts	+	+	-	
Health Education	-		+	
Physical Education	-			
Vocational Education	-	-		
Other: ESL	+	+	+	
Content Emphasis				
Critical Thinking	+	+	+	+
Cooperative Learning	+	+	+	+
Study Skills	+	+	-	
Self-esteem	+	+	+	+
Interest/Attitude	+	+	+	+

+ = Major Emphasis - = Secondary Emphasis Blank = No Emphasis

B. Staff Development

For the training activities, major emphasis was placed on basic orientation/introduction and instructional applications, with only some concentration placed on classroom

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management. From 1989 through March 1990, the Los Angeles MTS provided 155 hours of formal training to 448 teachers and three aides. More than 90% of the training was provided by project staff while 10% was provided by business partners. Levels of staff involvement and training topics for these formal training activities are summarized in Exhibit VI-5.

In addition, three of the sites report an average of 1,000 hours per year in informal training activities paid for by each school.

Exhibit VI-5

Project Related Training 1989/90 and 1990/91* Years **Total Formal Training Hours = 155**	
Type of Participant	**Number of Participants**
Teachers	448
Aides	3
Administrators	0
Clerical	0
Parents	0
Topics for Training	**Degree of Emphasis**
Basic Orientation/Introduction	Major Emphasis
Instructional Applications	Major Emphasis
Classroom Management	Secondary Emphasis
Office Administration **	No Emphasis

* Only includes training through March of 1991

** The formal office administration training for administrators and clerical is provided by the Information Technology Division of LAUSD. Informal assistance on a person by person basis is provided by Project members at the site when requested.

C. Learning Resources Management

Prior to purchase, project management personnel and project teachers examined new software and hardware. In addition, there are teachers that "Beta-test" software with their classes. This means that they use new software on a test basis. Management and control of technology resources were the basis of re-emerging issues raised at each of the school sites. Insufficient input on technology purchases and a lack of control over technology use were concerns expressed by a number of teacher and survey respondents and teacher interviewees.

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D. Dissemination

Two dissemination approaches which have been effective are site visits and conference presentations. In years 3 and 4 a total of 525 visitors toured these MTS sites, although only one site visitor survey was returned during the period of January through May of 1991 in conjunction with this evaluation.

Within the school, dissemination occurs by way of staff meetings, training workshops and site visits. Project-wide dissemination activities are summarized in Exhibit VI-6.

Exhibit VI-6

Summary of Dissemination/Marketing Activities for the Los Angeles Project			
Total Developed through Project	In Progress	Ready to Disseminate	Already Disseminated Sold/Donated
Products	61	70	1
Services	2	0	0
Total Activities for Disseminating Information	In-School	In-District	Out-of-District
	103	20	30
Total Visitors to the Project	Years 1 & 2	Year 3	Year 4
	138	225	300

E. Evaluation

An evaluation team headed by Dr. Joan Herman, of the UCLA Center for the Study of Evaluation (CSE), conducts the local evaluation component of this project. Due to the funding difficulties at the onset of the project, no formal relationship between UCLA/CSE and the project existed during the initial planning stages. However, the project director was able to serve as an advisor to aid in articulating the project's goals and thus, present a design for subsequent research and evaluation.

During year 2 the evaluation team found staff development to be an important issue. The research findings encouraged management to strengthen follow-up and support activities by providing individual sessions with site coordinators. The individual sessions allowed teachers to have flexible training opportunities to meet individual needs and to provide assistance in integrating technology with regular classroom activities.

For years three and four, the evaluations have shown how technology has had an effect on students' attitudes and teachers' instructional roles. As technology becomes central to instruction, interaction between students and teachers begins to change. With the use of technology, students are more inclined to work independently and to complete homework or school projects. In addition, students are using higher order thinking skills on complex projects and are increasing their class participation.

Some of the most important research findings and resulting program modifications, as described by the research team, are summarized in Exhibit VI-7.

Exhibit VI-7

Research Findings by Evaluation Team and Program Modifications by Year

Year	Finding	Program Modification
1	No formal relationship between UCLA/CSE and the MTS site. Project Director served as advisor and helped project to articulate goals.	Principal outcome was design for subsequent research and evaluation.
2	Findings encouraged management to strengthen follow-up and support for staff development, through individual sessions with site coordinators.	More flexible training opportunities were provided to meet the needs of individual teachers and to assist them in integrating technology into their regular classroom activities. Project management also increased its regular communication with school principals and worked to establish closer and more supportive working relationships with the principals.
3	Participants perceive effects on student outcomes and on the nature of teacher and instructions: student assessment results show some support for the impact of technology on student attitudes (i.e., students like using it and doing school projects on them) but no clear findings of impact on other student performance indicators (e.g., writing, standardized tests, attendance, grades)	(None were provided.)
4	Results not yet analyzed. However, observations thus far indicate that technology use is associated with changes in teachers' instructional roles, students working more independently, higher-level of thinking skills on complex projects and higher levels of student engagement.	(None were provided.)

IV. Program Implementation

Planning and decision making within this MTS site was generally reported to be centralized. As a result, project implementation at individual school sites was strongly

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affected by the Project Steering Committee's decisions. Technology placement, which was decided upon by the Project Steering Committee, varied from school to school. The elementary schools featured computers, laserdisc/interactive video, audio/video production, instructional television, LCD Panels/Video projectors and CD ROM. The middle school emphasized technology such as computers, laserdisc/interactive video, audio/video production and CD ROM. For the high school, emphasis was placed on computers, laserdisc/interactive video and telecommunications.

The Technology Center is the one place in the school where all the technology is available for use and/or to check out to take to individual classrooms. It is a classroom where students may come and have access to all the technology to finish their projects or merely learn a particular procedure, application or a part of their curriculum. It is a center for training faculty or school staff. The Center may be reconfigured to accommodate the requirements of a class or for ease of training adults. Nothing is locked down and, therefore, equipment is easily moved within the room or without. The concept is one of multiple-use and convenience for all involved students, teachers, and staff members.

A. Corona Elementary School

This school is reported as the most successful site in the district, even though the technology center was not available during a period of time due to the lack of a site coordinator. Since then, a special education teacher has been recruited as the new site coordinator. Now teachers, in conjunction with the site coordinator, are taking an active part in deciding what and how technology can best meet their needs and curricular emphases.

MTS teachers at this school are divided into team members and second-level teachers, who have joined the second phase of project implementation. Full access to resources are given to team members. In the case of second level teachers, they are provided with Tandy computers for their classroom; are invited to training sessions; and after training, can check out additional equipment. They are permitted in the technology center as soon as they have learned to use the computers. However, second level teachers are not allotted regular technology center hours nor do they have to complete individual projects. Students are scheduled a minimum of two hours a week but use the equipment outside of pre-scheduled class time working on special projects with the teacher's permission. The coordinator has found students using the computer as much as 5-6 hours. As motivation and technology use increases, they report that the gap between disadvantaged and advantaged students is closing (e.g., for LEP students). Furthermore, the impact can also be seen in the form of enhanced teacher use (e.g., MAClab, MAC, MAC Training).

B. Loma Vista Elementary School

This school has had difficulties in implementing the project. This was largely due to differences in opinion between the school and project leadership. During a period of time, MTS was almost pulled from this site. The school's Apple lab, funded by special district monies unrelated to the MTS project, was locked and access denied to MTS teachers. However, due to actions taken by the Local Leadership Council and parental pressure, the MTS project was allowed to continue. Twenty-one new teachers were added to the team, bringing the total number to thirty one. The new teachers received extensive, fast-paced formal training to bring them up to speed; all teachers were encouraged to practice what they had learned at each formal training session and at home. The current emphasis is on infusing technology into curriculum areas such as, English/language arts, history-social science, science, and visual and performing arts.

C. Nimitz Junior High

There were also some initial difficulties with the program at Nimitz Junior High School. Some disagreements over project control issues were reported by both project and school leaders. However, the project staff and administration have managed to improve the situation. Teachers, in conjunction with the site coordinator, have more control over the management of resources. Furthermore, the site coordinator has made an important difference by offering training sessions and providing private consultation to individual teachers. Awareness among staff about the beneficial impact the MTS project has had on students and teachers has left uninvolved teachers feeling as if they are missing new opportunities to learn instructional techniques. Infusion of technology has occurred in curriculum areas such as literature/language arts, history-social science, science and health education.

D. Bell High School

In accordance with the state plan for phased implementation, it was determined that Bell High School would not fully enter the project until the fourth year. As a result, it has not yet received the full benefits of resources and training in comparison to the other school sites. Nonetheless, technology is currently being infused into the English/language arts department. Video production has become a major emphasis at the high school. Although this program was in place prior to the advent of the MTS project, it has given the program a critical boost. The high school has just recently become the broadcast station for the local public television network.

Exhibit VI-8 summarizes the emphasis in various types of technology by site.

Exhibit VI-8

Types of Technology Use by Site				
	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Computers	+	+	+	+
Laserdisc/Interactive Video	+	+	+	-
Instructional Television (ITV)	+	-	-	
Audio/Video Production	+	+	+	+
Satellite downlink for ITV reception/distance learning	-	-		
LCD Panels, Video Projectors	+	+	+	-
CD ROM	+		+	
Technology for the handicapped	-		-	
Science Lab Equipment			-	-
Calculators		-	-	
Telecommunications	+		-	
Music	-		-	+

+ = Major Emphasis - = Secondary Emphasis blank = No Emphasis

V. Support Resources

Many of the problems related to program implementation and resource management are reported by site staff as resulting from the centralized approach being used by the Project Steering Committee. MTS teachers tended to report relatively little participation in choosing and managing equipment for the project.

Based on the self-evaluation form, the project schools indicated few discrepancies between support needed and actual support received, in the areas of school, project and district administration. However, a somewhat less harmonious picture was sometimes depicted through the interviews with the project director and school staff, especially at Loma Vista and Nimitz schools. In the case of Bell High School, a very notable discrepancy was found under business partners (with an initial score of 3 on a 4 point scale reporting the level of support needed, actual support was rated as 1). It was reported that the number of partnerships and the amount of support anticipated at this school did not materialize. The score of 1 on business partnerships for Bell reflects the fact that Bell High School had just begun its full phase-in at the time of the evaluation and had not yet received the benefit of several business partnerships which were in the process of being formed at that time. The junior high school reported a low score for the actual support it received from the California Technology Project. In order to increase this support, it was suggested that five annual user group meetings should be held on-site for project coordinators. The other two schools also indicated that support was low from both the business partnerships and the California Technology Project.

VI. Funding Support

Exhibit VI-9 summarizes AB1470 technology expenditures by school and for project-related district-level administrative and support activities for the 1989/90 school year. This is followed by Exhibit VI-10 which presents technology expenditures at the project schools and for project-level administration and support from all sources. Note that the school and district-level breakouts requested for these two tables were not provided. Therefore, only the totals are shown.

Exhibit VI-9

AB1470 Technology Expenditures for 1989/90						
	Corona Elementary*	Loma Vista Elementary*	Nimitz Junior High*	Bell High*	District Administration*	TOTAL
Certified Salaries						$151,559 (30.3%)
Classified Salaries						$67,246 (13.4%)
Employee Benefits						$25,192 (5%)
Books & Supplies						$60,427 (12.2%)
Services						$110,600 (22.1%)
Capital Outlay						$84,976 (17%)
TOTAL						$500,000 (100%)

*No breakouts for individual schools and district administration were given.

Exhibit VI-10

Total Technology Expenditures at Project Schools
by Source for 1989/90

	Corona Elementary*	Loma Vista Elementary*	Nimitz Junior High*	Bell High*	District Administration*	TOTAL
AB1470						$500,00 (52.4%)
District General Funds						$216,000 (22.6%)
District Categorical Funds						0
Donations - Estimated Value						$238,495 (25%)
TOTAL						$954,495 (100%)

* No breakouts for individual schools and district administration were provided.

VII. Outcomes

This section is broken-out by four levels of project participants. The benefits attributed to MTS are attributed to each. However, the project has had a greater beneficial impact on students and teachers. With the introduction of technology, teachers have developed new instructional techniques to enhance student learning. As students begin to take an active part in their education, teaching has become increasingly interesting and exciting for teachers. As they become more aware and comfortable with the technology available to them, they report becoming more willing to share experiences with other teachers, educators and administrators.

A. Students

Overall, schools have noted a positive increase in student behavior. Students are beginning to set higher standards of performance for themselves. Such high standards are noted when they utilize technology to enhance learning and when they dedicate personal time to work on projects. Students are applying problem solving techniques to projects, taking initiative and working independently. There is also an improvement in and greater use of oral and written language skills. More significantly, the gap between advantaged and disadvantaged students is closing. In the case of this project, it is reported to be primarily occurring between non-LEP and LEP students. The site schools have also seen more multimedia use and student participation in extracurricular activities.

Exhibit VI-11A
Student Behavior Outcomes

Student Behaviors	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Fewer class absences	* ↑	* ↗	not indicated	not indicated
Completion of homework	** ↑	* ↗	not indicated	not indicated
Participation in extracurricular activities	* ↑	* ↑	not indicated	not indicated
Completion of extra tasks without being asked	** ↑	* ↗	** →	not indicated
Higher standards of performance	** ↑	* ↗	** ↑	not indicated
Use on non-class time for computers	* ↑	* ↗	* →	not indicated
Use of multi-media	↑	* ↗	↗	not indicated

Student Performance Prior To Project:

Blank = Not Present of Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

B. Teachers

Between the schools, the behavior of teachers differs significantly. Most change has occurred at the elementary school. Meanwhile, behavior of teachers has remained constant at the junior high school. One of the elementary schools reports teachers volunteering personal time on evening and weekends to work with colleagues on technological projects. Teachers have also provided training sessions on Hypercard TM for teachers at the other elementary school. In the last 2-3 years of the project, teachers have written several grants. The increase use of personal time has been the most notable difference at the second elementary school. There has also been an increase in teachers initiating new activities, sharing ideas about educational activities and learning from one another.

Exhibit VI-11B
Teacher Outcomes

Instructional Method	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Direct instruction/Lecturing	•• ↘	••• ↑	••• ↘	not indicated
Teacher-student discussion	••• –	••• –	••• ↘	not indicated
Individual instruction	•• –	••• –	↗	not indicated
Cooperative learning	•• ↗	• ↗	• ↑	not indicated
Student-based projects	•• ↗	• ↑	• ↑	not indicated
Instructional Emphasis				
Skill-based	••• –	••• –	••• ↘	not indicated
Content-based	••• ↑	••• –	••• –	not indicated
Affective domain	•• ↗	•• –	•• ↗	not indicated
Cognitive emphasis	•• ↗	•• –	•• ↗	not indicated
Problem solving emphasis	•• ↗	• ↑	•• ↗	not indicated
Technical Emphasis				
ITV	• ↗	↗	• –	not indicated
Computer	• ↑	• ↑	•• –	not indicated
Audio Tape	•• ↑	• –	• –	not indicated
Laser disc	↑	↑	↑	not indicated
Calculator	• ↗	• ↗	• –	not indicated
Camcorder	↑	↑		not indicated
Telecommunications	↑	↗	↗	not indicated
Technical Use				
Drill and practice	• –	••• –	•• ↘	not indicated
Presentation of content	↑	••• –	•• –	not indicated
Application to problem solving	↑	↑	• ↗	not indicated
Word processing	• ↑	↑	• ↗	not indicated
Desktop publishing	• ↑	↑	• –	not indicated
Computer aided drafting	↗			not indicated
Yearbook	↑	↗	•• –	not indicated
Student newspaper	↑	↗	•• –	not indicated

Student Performance Prior To Project:

Blank = Not Present of Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
– = No Difference
↗ = Some Increase
↑ = Large Increase

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Over the course of the project the two elementary schools and the junior high school indicated project-related improvement in some outcome areas. At all three of the schools, there was an increased use in cooperative learning and student-based projects as instructional methods. As a result, they reported an increase in problem solving, cognitive and affective domain emphases on instruction. At the high school, where access to technology occurred in Year 4, the teachers have begun to show a great interest. Through training sessions, they reported that teachers are starting to change teaching strategies.

Use and emphasis of technology has ranged from school to school. At three of the schools there has been an incredible emphasis placed on laser disk technology. In addition, the two elementary schools have placed a considerable amount of emphasis on computers and camcorders. Although all of the schools have seen a considerable growth of technology use in various areas, they do hold application to problem solving and word processing in common. At the junior high school, they report a considerable increase in multimedia use. These results, as reported by project staff on the self-evaluation form, are summarized in Exhibit VI-11B.

C. Administrative and Other Staff

For the school and district administration, it is reported that the use of technology has proven to make the work environment more efficient. With the use of computers and software (e.g., wordprocessing, data bases), continual maintenance and quick retrieval of school records is easier and more efficient. Furthermore, telecommunications has allowed for increased contact between schools and districts. At the junior high school, the use of technology for administrative purposes has remained high and consistent throughout the project. Prior to the project there had been considerable use. On the other hand, the elementary school noted little or no use of technology prior to the project. Since the initiation of the project, there has been a tremendous increase in the use of technology for lesson planning, recording grades, scheduling classes and recording attendance.

The MTS project has also had an indirect impact on upcoming teacher forces. Those aides involved in the project will enter career training in education with the knowledge of integrating technology in curriculum.

D. Business Partnerships/Parents

Prior to MTS, businesses showed very little interest in actively supporting education at the schools. With the assistance of the Los Angeles Educational Partnership, critical corporate, foundation, and vendor support of the project was brokered. This has resulted in a tremendous increase in awareness, support and time spent at the schools offering assistance. The project schools have noted that their business partners have had active involvement in project planning and implementation. As the project has progressed, there has been some increase in the scope of businesses wanting to participate.

Parent-related outcomes are reported as largely unchanged since the project inception. The one exception is the enhanced use of technology in the home.

Exhibit VI-11C
Administrative and Other Staff Outcomes

ADMINISTRATIVE USE	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Scheduling Classes	* ↑	not indicated	*** →	not indicated
Recording Attendance	↗	not indicated	*** →	not indicated
Maintaining Grades	↗	not indicated	*** →	not indicated
Use of Auto Dialer	not indicated	not indicated	*** →	not indicated
STAFF BEHAVIOR				
Sharing resources	↑	** ↗	*** →	not indicated
Initiating new activities	* ↑	* ↑	** →	not indicated
Cross-talk about educational issues	* ↑	* ↑	*** →	not indicated
Volunteering personal time training, etc.	↑	** ↗	** →	not indicated
Feeling of collegiality	* ↑	** ↗	** →	not indicated
Improved morale	* ↑	** ↗	** →	not indicated
Helping peers	* ↑	* ↗	** →	not indicated
Learning together	* ↑	* ↑	** →	not indicated
Seeking assistance/help	* ↑	* ↗	*** →	not indicated
Writing Grants	↑	* ↗	** →	not indicated

Use and Practices Prior To Project:

Blank = Not Present of Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

Exhibit VI-11D[1]
Business Partnership and Parent Interaction Outcomes

BUSINESS PARTNERSHIPS	Corona Elementary	Loma Vista Elementary	Nimitz Junior High	Bell High
Solicitation of businesses to collaborate with school	* ↗	* ↗	* ↗	↗
Appropriate fit between business/school agenda	↑	* →	** →	↗
Number of business partners	* ↗	* ↗	* ↗	↗
Scope of business partnerships	* ↗	* ↗	* →	↗
Active involvement in project planning	↑	* ↑	* →	↗
Active involvement in project implementation	↑	* ↑	* →	not indicated
PARENT INTERACTION				
Use of parent volunteers	** →	** →	* →	not indicated
Attendance at PTA, etc.	** →	** →	** →	not indicated
Parent use of technology at home	↗	↗	* ↗	not indicated
Amount of parent/school contact re: instructional matters	** →	* →	* →	not indicated
Attendance at school events	** ↗	* →	* →	not indicated

Partnerships and Interaction Prior To Project:

Blank = Not Present of Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

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[1] District says "The response to this section may accurately reflect school perceptions; however, the large percentage of business involvement and assistance is channeled through Project staff and thus, teachers are not always familiar with the full benefits of business assistance which they are receiving."

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VII. Recommendations/Comments

Some recommendations and comments were made by project participants in regard to the future use of technology in California during the interviews. This section of the self-evaluation survey was not completed. A summary follows:

- Importance was placed on future MTS teacher recruitment and training. It was pointed out that for potential project involvement by teachers, there should be several presentations stressing awareness of technology and the potential of the program. Through several presentations, teachers will have a solid foundation to base their decision to join MTS -- then they will not feel as if the decision has been imposed.

- It is necessary to make the MTS project more visible in the school, either through displays of student and teacher projects; testimonials regarding MTS activities; or through classroom observation so that teachers can be enticed into the program.

- MTS teacher recruitment could be increased by providing training during school hours. Many teachers decided not to join when they realized the amount of personal time it would take to participate. However, the district also notes the difficulty associated with the provision of training during school of their year round structure

Chapter VII
Monterey Model Technology Schools Project

The data sources used to evaluate the six Level I Model Technology Schools Project include:

- the *Level I Project Self-Assessment Inventory*
- self-administered surveys for students, MTS staff, and site staff
- personal interviews conducted on site with district administrators, MTS staff, principals, site coordinators, and teachers (a total of 34 people)

A summary of the findings are presented below.

I. Background Information

In 1987 the Monterey Model Technology Schools Project (MMTS) received one of the early awards. The 1991-92 school year will be its fifth full year of operation.

A. Project Background

The Project Director guided the task force that brainstormed and developed the original proposal. When the request for a proposal was issued, she was a computer education resource teacher who also operated a computer lab donated by IBM. Several schools in the district were beginning to use technology. Her interest in staff development matched a fundamental characteristic of the grant solicitation. She worked closely with the Grant Development Consultant and coordinated the brainstorming sessions with school-based educators that led to the vision for this project. Outside consultants worked with the team in developing the proposal.

This award permitted the district to move forward with technology. The project schools had some technology, but it was scattered. For example, Manzanita had one workstation in the office, the library was using Circulation Plus, and a few VCRs were in the classrooms. Ord Terrace had installed more hardware, facilitated by its designation as a math/science magnet school. A Write to Read lab was obtained with AB803 funds. In the King Middle School, the staff describes its technology effort as limited: Science and language arts were the focus and teachers did not help one another to learn about technology. The Monterey High School was the most technology-active when MMTS began: An Apple IIe lab for ESL students, 15 IBM computers, and funds from AB551 for staff development. Many teachers purchased their own computers for school use. This high school is distinguished as one of the first in the United States to offer a video yearbook course.

B. Project Site Demographics

The MMTS project includes four district schools: Two elementary schools, one middle school, and one high school. The schools are located in two communities that are economically dependent on tourism and nearby military installations.

As reported in the template,the 1990-91 district enrollment is 14,763. Almost one-half are Caucasian, 35% are Black and Hispanic, and the remaining students are Asian, Native American, Filipino, and Pacific Islanders.

Profiles of each project school appear below, using data from the template and site interviews.

Ord Terrace Elementary School serves 660 students in grades K-5: 30% Caucasian; 25% Black; 23% Hispanic; 14% Asian; 9% Filipino, Pacific Islander, and Native American. Free or lunches at a reduced fee are available to 46% of the students. Many programs serve special student needs such as a math/science magnet, special day classes, and English as a Second Language.

Manzanita Elementary School serves 366 students in grades K-5: 46% Black; 17% Hispanic; approximately equal numbers of Asian, Caucasian, and Filipino and Pacific Islander. 53% of the students are eligible for a free or reduced fee lunch. Specialized programs include ESL, SIP/Chapter One, and Quality Education Program. The school is in session year-round.

King Middle School houses grades 6-8 in six buildings. This is a neighborhood school attended by 624 students. The student population is: equal proportions of Caucasian and Black (32% each); 14% Spanish; 11% Asian and 9% Filipino and Pacific Islander. Included among the 10 specialized programs are: Human Relations Team; Morning Math program; and Student Assistance Team. Students eligible for a free or reduced fee lunch number 18%.

Monterey High School serves 1,574 students in grades 9-12 from several peninsula cities. The student population is almost 50% Caucasian; 19% Hispanic; equal proportion of Asian and Black (12%); and the remaining 8% Filipino, Pacific Islander, and Native American. Approximately 15% of the students are eligible for a free or a reduced fee lunch. Eight programs serve special students needs such as: ESL magnet; SCORE for college; International Student Exchange.

The school demographics for the Monterey project are summarized in Exhibit VII-1.

Exhibit VII-1

Monterey Project - School Level Demographics

	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Grade Levels	K-5	K-5	6-8	9-12
Percent Minority	70.5%	89%	67.8%	51.3%
Percent Chapter 1	58.6%	70.8%	49.5%	0
Percent LEP	29.2%	20.8%	49.5%	23.3%

C. Project Description

The vision expressed by the educators who participated in the conceptual framework has been translated into two fundamental characteristics. The first is a "bottoms-up" approach that gives planning and development responsibility to those required to implement the project -- school-based educators. They share in making decisions about project expenditures, purchase of hardware and software, technology-based classroom implementation plans, and training requirements. A second fundamental characteristic that complements teacher empowerment is student-centered instruction that strives to improve academic performance and develop student investment in learning, proactive behaviors.

At Ord Terrace Elementary School, all levels of staff are active in MTS: both school administrators, the site coordinator, 30 out of 40 teachers (only 5 are not involved at all), and both clerical staff. The principal is the fourth in four years, a highly committed leader who strongly supports MTS.

At Manzanita Elementary School, only six staff (2 teachers and 4 aides) are indirectly involved in the project; the remaining 24 are active participants. The principal strongly supports MTS and has been in the school three years.

Of the 36 teachers at King Middle School, 14 are active project participants plus approximately one-half of the aides, clerical staff and administrators. The principal helped select project schools when the proposal was submitted, has been in this site since the beginning of the MTS, which he strongly supports.

Monterey High School came to MTS with a strong background in technology and all of the 32 teachers actively participate, in addition to two of the four administrators. There is less participation among the aides and clerical staff, but active involvement among 3 of the 7 librarian/counselors.

Project participation by type of staff is summarized for each school in Exhibit VII-2.

Exhibit VII-2

Total Staff Reporting Active Project Involvement by School[*] and Active Participants as a Percent of Total Staff

	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
School Administrators	2 (100%)	1 (100%)	2 (100%)	2 (50%)
Site Coordinators	1 (100%)		1 (100%)	1 (100%)
Teachers	30 (75%)	17 (89.4%)	14 (15.9%)	32 (100%)
Aides	3 (11.1%)	4 (50%)	3 (42.8%)	2 (40%)
Clerical Staff	1 (50%)	2 (100%)	3 (75%)	
Parents				
Other				3 (42.8%)

[*] Active involvement refers to staff who were actively implementing project administrative or instructional components during the Spring of 1991.

II. Planning and Restructuring

Planning objectives are integral to the MMTS: Developing school-based plans to infuse technology into the curriculum is central to the project. The process for designing an annual plan begins with the MTS staff, and is then presented to the decision-making body, the MTS Management Team. Team members include district administrators, a principal/teacher team from each school, and the MTS staff. Annual planning is typically completed before the close of each school year so it can be incorporated in the continuation application submitted to CDE.

Each of the four schools has a site-based planning committee that has historically functioned in many ways: original proposal development; annual site plan; review project changes; project advocate; project monitoring; and project evaluation. In the elementary schools, technology use was written into the School Improvement Plan. The middle school incorporated technology into the SBCP and the high school developed a separate technology use plan. All schools' technology plans correspond to the overall district plan. Site administrators in three schools meet with the site planning teams, although their roles differ: some lead the discussions, while others sit as a participant. The planning team at the high school is teacher-driven, led by a veteran technology user whose judgment and leadership is respected by both staff and administration. This team meets as needed.

Data concerning the frequency of meeting, functions by project year, and membership for the project planning committees at each site are presented in Exhibit VII-3.

Exhibit VII-3

Project Technology Planning Committees				
	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Frequency of Meetings	Monthly	every 6-7 weeks	Bi-monthly	As needed
Functions by Project Year				
	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Orig. Proposal Development	Year 1	Year 1	Year 1	
Design of Annual Site Plan	Year 1-4	Year 1-4	Year 1-4	Year 1-4
Advising on Project Changes	Year 1-4	Year 1-4	Year 1-4	Year 1-4
Advocating for the Project	Year 1-4	Year 1-4	Year 1-4	Year 1-4
Monitoring the Project	Year 1-4	Year 1-4	Year 1-4	Year 1-4
Evaluating the Project	Year 1-4	Year 1-4	Year 1-4	Year 1-4
Membership				
	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Administration/Support Staff	5	3	7	13
Teachers	40	19	36	32
Aides	27	8	7	5
Parents	1	90-120	varies	0

III. Content

A. Curriculum

All curriculum areas are addressed in this project. Teachers and administrators reviewed a list of curriculum areas and process areas, then identified those which received major or secondary emphasis. These are summarized in Exhibit VII-4.

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Exhibit VII-4

Curricular and Process Emphasis of Project by Site

Curricular Emphasis	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
English/Language Arts	+	+	+	+
History-Social Science	-	-	+	-
Mathematics	+	-	+	-
Science	-	+	+	+
Foreign Language			+	-
Visual and Performing Arts	-	+	-	+
Health Education		-	-	-
Physical Education			-	-
Vocational Education				-
Other: Library				+
Other: ESL				-
Content Emphasis				
Critical Thinking	+	+	+	+
Cooperative Learning	+	+	+	+
Study Skills	+	-	-	+
Self-esteem	+		+	+
Interest/Attitude	+	+	+	+
Other		+	+	

+ = Major Emphasis - = Secondary Emphasis Blank = No Emphasis

All schools place major emphasis on English/Language Arts, followed by three who focus on science, and two for whom math is major emphasis. Each school has chosen the disciplines which receive major attention: one school selected five; one selected four; one selected three; one selected two.

Three schools place major emphasis on critical thinking, cooperative learning, and interest/attitude. Three addressed self esteem (the fourth school did not rate this item) and two schools focus on study skills.

B. Staff Development

The hallmark of the MMTS training is a process that fosters individualized technical assistance: Teachers specify what type of information and help they need and when it will be most useful. The "Super Sub" concept, a process of relieving teachers of classroom responsibilities through training, attempts to reduce traditional barriers to involvement in new projects (e.g., dependence on personal time and use of prep time). Super Sub permits staff development during the school day by providing a rotating substitute teacher throughout the day to permit teachers to meet one-on-one with the project trainer on-site. Teachers may use the time to learn new software or hardware, receive assistance with the classroom implementation plan, or classroom management. The choice rests with individual teachers, who endorse this approach.

From 1989 through March 1990, the MMTS provided 2,873 training hours to 737 people that included teachers, aides, administrators, clerical staff, and parents. A striking feature of MMTS is peer training among the staff. More than 75% of all training is done by district personnel. Major emphasis is placed on instructional applications, classroom management, and office administration. Levels of staff involvement and training topics are summarized in Exhibit VII-5.

Exhibit VII-5

Project Related Training 1989/90 and 1990/91* Years Total Training Hours = 2,873	
Type of Participant	**Number of Participants**
Teachers	226
Aides	100
Administrators	25
Clerical	44
Parents	330
Topics for Training	**Degree of Emphasis**
Basic Orientation/Introduction	Secondary Emphasis
Instructional Applications	Major Emphasis
Classroom Management	Major Emphasis
Office Administration	Major Emphasis

* Only includes training through March of 1991

C. Learning Resources Management

The district administrator described how resources were managed district-wide. Each school in the district has an automated resource center that was established before the MMST award. A certified person in each school is responsible for this center. The schools channel all hardware and software through the district level Instructional Materials Center (IMC). The huge inventory required by MMTS led to revised procedures for facilitating the purchase, process, and distribution of the materials to the MMTS sites. The process is now reviewed more frequently than before.

Software Review Process. Teachers who wish to review software submit a written request to the IMC which is then processed by the district librarian. If a vendor submits an item for review, it must be circulated to three teachers of the grade level for which the software is designed. Teachers complete an evaluation form and return all materials to the IMC. Good or excellent ratings create eligibility for purchase of the product: The district librarian publishes reviews of all new materials each quarter.

D. Dissemination

Two major dissemination strategies were used in the third and fourth years of the project. The first strategy is providing information about the project to site visitors. The template shows that 488 visitors have toured site schools to observe technology being used in classes, listen to teachers describe how they plan and implement lessons, and ask questions that inform their decision-making about integrating technology into the curriculum. The second strategy is conference presentations: project teachers and administrators describe key elements of their process and demonstrate products emerging from MMTS.

Dissemination occurs within the Monterey district. For example, project activities are reported at site staff meetings and district-wide meetings and training workshops are held for district personnel.

The major products to be disseminated are Classroom Intervention Plans (CIP). A CIP is a detailed description of specific instruction activities, training and support required for implementation. Teachers work individually or in teams to develop these annual plans. Project staff provide critical support to teachers by transforming their ideas into a written package. In 1990, 80 teachers were implementing 55 CIPs. A CIP may be developed for any number of students. The average student grouping is 30. (Cradler's 1989-90 report). According to the template, sixteen CIPs are in the final production for dissemination early next year. Teachers are particularly grateful to receive help in converting their ideas into a final CIP product. Examples of CIPs include: weather-watch utilizing databases and telecommunications; MACStar for post-high school planning; teacher generated video lessons for art instruction.

Two additional documents will be available for dissemination: Build Your Own Supersub Service and a manual describing the implementation of MMTS within the district.

The template explains how candidate products and services will be evaluated prior to dissemination. The research team will play a critical role in validating products and services. They will examine data on the impact of each intervention, identify the most promising products and practices, and collect information from visitors on their perceived value of the demonstration.

The currently implemented dissemination practices such as visit and workshop presentations are assessed by questionnaires administered to the visitors, workshop evaluations, and numbers of educators who attend "awareness activities." Some materials and products have already been disseminated. The research team conducts a telephone survey of those adapters/adopters and plans to visit a sample of those schools who plan 1991-92 adaptations/adoptions. Project-wide dissemination activities are summarized in Exhibit VII-6.

Exhibit VII-6

Summary of Dissemination/Marketing Activities for the Monterey Project			
Total Developed through Project	In Progress	Ready to Disseminate	Already Disseminated Sold/Donated
Products	35	10	7
Services			5
Total Activities for Disseminating Information	In-School	In-District	Out-of-District
	110	63	71
Total Visitors to the Project	Years 1 & 2	Year 3	Year 4
	not counted	189	299

E. Evaluation

The evaluation team is headed by John Cradler, Education Support Systems, Inc. This firm was hired when the relationship between the original evaluator and the district was mutually dissolved. As described in the template, the relationship between the research team and the project is a partnership. The emphasis on a formative approach has resulted in key management decisions that strengthened the project. Most notable and recognized by staff at all project levels is the Year 1 finding that teachers need clearly defined roles and expectations to be effective. The result was the CIP, the focus of teacher involvement. Teacher autonomy increased as individuals became comfortable with technology. They identified opportunities for using a video, camcorder, computer, or laserdisc and requested assistance when necessary to develop a plan or operate a new piece of equipment. Technology is central to instruction for many project teachers, leading to dramatic changes in lesson planning and student interaction.

Other examples of how the research findings have influenced the project include:

- teachers' increased confidence with the technology resulted in more autonomy to guide their classroom implementation effort as most suited their professional needs
- evidence of proactive student learning and collaboration between teachers and administrators convinced district administrators that MMTS strategies could be usefully incorporated into district level plans
- teachers' acceptance of technology in instructional strategies is becoming an integral part of planning that will necessitate review of the overall curriculum agenda

The MMTS project has made a difference in the district. Strategies for technology infusion in the curriculum are being adopted district-wide, in a major policy decision from the Superintendent. The district administrator stated that both the "bottoms-up" process (in community and the schools) and technology were fundamental to a new plan for the next decade. The MMTS provided a model for involving constituent groups in decision-making and experience in making wiser choices for materials and training.

The Project Director hopes to continue to administer the teacher and student surveys, in addition to ongoing implementation of the CIP. Future research projects will include an assessment of the integrated learning systems at King Middle School plus a comparison of CAP and CTBS scores between technology-rich and technology-limited schools.

Some of the most important research findings and resulting program modifications, as described by the research team, are summarized in Exhibit VII-7.

IV. Program Implementation

The curriculum areas and the process areas emphasized by each school appear in Exhibit VII-4 of the Content section of this chapter.

The technology placement within each project school varies by need and staff choice. More than 15 types of technology are available and approximately 7 are used in the elementary and middle schools. The high school features computers, laserdisc/interactive video and audio/video production equipment. Each site chooses how to allocate the budget it receives from the MMTS grant.

Exhibit VII-7

Major Research Findings Reported by Evaluation Team and Program Modifications by Year

Year	Finding	Program Modification
1	Teachers need a clear definition of what they are expected to contribute to the project.	The development of and implementation of operationally defined project intervention plans (CIPs) which focus instructional activities to meet identified student needs.
2	Teachers reported increased confidence in using technology, increased involvement in meaningful planning for technology use and increased commitment to the project by the teachers and site administrators.	Teachers were given more autonomy, and were allowed to implement technology at their own pace and in accord with their own teaching style and professional development needs.
3	Increases in student proactivity, grades, application of student centered teaching strategies and collaboration between teachers and administrators were reported.	Technology was integrated into existing school level plans. We also began to incorporate MMTS strategies into district level planning for technology use and to identify and refine specific MMTS classroom intervention plans for dissemination during year four.
4	Technology is playing a central role in the development of lessons as teachers are internalizing the use of technology. It is becoming an automatic part of their instructional planning.	Teachers are finding it necessary to rethink and restructure the overall curricular focus and instructional programming.

A. Manzanita Elementary School

This school has a literature-based technology program, using the Houghton-Mifflin Guide. Teachers select an area they wish to enhance. For example, language arts teachers in grades 1-3 developed a CIP called LITVIT: students choose a book (on video) once each week, look at the video at home with their parents, then make a commercial about the book for their class. The commercials are taped in the "Reader's Theater" and watched and critiqued by the entire class. It is a very popular activity. Teachers seem comfortable with many formats. Videos, camcorders, and laserdiscs are used by all project teachers, and using computer labs is an option. The teachers are resources for one another: each staff member is not expected to be an expert on all technologies. The staff chose to use funds originally allocated for a Site Coordinator position to purchase learning resources.

B. Ord Terrace Elementary School

This school has 27 separate programs. The educators report that technology is moving into the mainstream of that school. It has been a fragmented and slow process. The new principal is committed to using technology and has indicated her commitment to her staff. In addition to the MMTS site committee, other leadership committees such as the Bilingual Advisory Committee and the PTA incorporate technology in their plans. The principal plans to reallocate funds available from a reduction in teacher aides to support technology. She held a teacher seminar to discuss school-wide planning and solicited ideas about how technology can be taken into the classroom. Effective CIPs will be shared across appropriate grade levels and revised annually so all teachers will feel ownership. There are lots of "experts" on site (e.g., ITV), especially the Site Coordinator who was using computers in a magnet school class 10 years ago.

C. King Middle School

The principal states that MTS is a big part of the school plan. He advocates enthusiastically for technology. All staff are aware that this school is a MMTS site. If teachers wish to receive equipment, they must participate. One of the MMTS strengths is the increase in staff morale: They are proud, excited and are more open now to change. Many of the anxieties of the first year have disappeared and technology is a major part of the overall school plan. The principal, who is also the tour leader, hopes to install telecommunications in each of the six major buildings plus a school network that provides teacher access to management data. The Site Coordinator estimates 90% teacher involvement and teachers report there is no separation between MTS and the school. The buy-in was the lab, and teachers learned with students. The CIPs were the most difficult aspect of the early implementation, but teachers now develop their own, with project staff support. It's a necessary and useful tool to force people to learn how to play with their "new toys."

D. Monterey High School

This school infuses technology in the English, Science, ESL(math), the Visual and Performing Arts Departments and in the library. This is the second implementation year. The teachers described an open invitation for all teachers to join the project, and the first year was devoted to planning, minimum training, conference attendance (teachers applied to Site Committee to attend conferences). The thirty participating teachers in the second year all sat on the Site Committee and chose to invest the site budget in equipment rather than staff development. Teachers are self-taught on the technology, but they rely on the "early experts" in a technology to assist others. A few enjoy reading manuals and conquering a system; they train the others. The video production is a hallmark of MMTS at this school. Students choose what roles to play -- they may serve as editors, storyboard developers, film crewpersons, etc. They learn new skills after they train someone else to perform their tasks. The video crews are a school resource. One of the least expensive CIPs is in the Spanish class. Each of 125-150 students must make one phone call per month to a parent and report a positive incident about school. This is a well-received project and now other teachers want a telephone in class in order to replicate the idea.

Exhibit VII-8 summarizes the emphasis in various types of technology by site.

Exhibit VII-8

Types of Technology Use by Site

	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Computers	+	+	+	+
Laserdisc/Interactive Video		-	+	+
Instructional Television (ITV)	+	+	+	-
Audio/Video Production	+	+	+	-
Satellite downlink for ITV reception/distance learning				
LCD Panels, Video Projectors		-	-	-
CD ROM		-	+	-
Technology for the handicapped	+		-	
Science Lab Equipment	+	+	+	-
Calculators	+	+	+	-
Telecommunications	-	+	+	-
Music	-	-	-	-
Other: Overheads		+		
Other: Muppet boards/listening centers		+		
Other: Touch Windows		+		

+ = Major Emphasis - = Secondary Emphasis blank = No Emphasis

V. Support Resources

There is consensus at all levels that the "bottoms up" approach to decision-making was philosophically and managerially sound. Each school received a budget (portion of the overall grant) whose allocations rested with the Site Committee. The district has adopted the process to prepare its educational plan for the next decade. Site administrators recognize the ownership and commitment teachers have in projects they help define and manage. One Principal stated that this culture respects each other's choices: "It's powerful to see teachers in this role."

In general, there are few discrepancies between support needed and actual support, particularly within the district and from parents. The high school rated actual support lower (1 level on a 4 point scale) on all dimensions than support needed. All schools indicated that support from CDE and the business partners was lacking.

VI. Funding Support

The distribution of project funds across sites has followed the original plan. As described in the template, resources not encumbered by MMTS staff salaries and operating budget are allocated to each school. Indirect costs ranging from 4.3% to a projected 6.3% are paid to the district.

The bulk of the allocated funds per year is determined by the flow of the implementation process. The elementary sites were targeted in the first year, so the bulk of the funds was divided between them. In the second year, the middle school was the target, and so on. However, the secondary schools did not have to wait until "their turn" to receive funds. The elementary schools advanced a loan during the first year, so hardware and software purchase could begin. During the third and fourth year, the Management Team determined the level of support for each site. As a consequence, there was project activity in all schools during each implementation year.

Exhibit VII-9 summarizes AB1470 technology expenditures by school and for project-related district-level administrative and support activities for the 1989/90 school year. This is followed by Exhibit VII-10 which presents technology expenditures at the project schools and for project-level administration and support from all sources.

VII. Outcomes

Based on the on-site discussions and the information in the template, the MMTS project staff and teachers identified some important benefits to project participants. Outcomes by six categories of project participants are briefly discussed below. Each discussion is followed by a listing of outcomes, as summarized by project staff at each site.

A. Students

Educators agree that students display more motivation to learn content when technology is used. Computers are only one tool: Camcorders, for example, are very popular. They feel better about themselves when they see the products they can create. They become involved in what they are doing more quickly, stay on task longer, take more risks, and improve their problem solving ability. The high school teachers believe that student research skills have improved. Elementary teachers noted that technology has made a big difference in helping ESL/bilingual and special education students with instruction.

Student writing and critical thinking skills have improved. The gap between the "haves and have-nots" has decreased.

Exhibit VII-9

AB1470 Technology Expenditures for 1989/90

	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High	District Administration	TOTAL
Certified Salaries	$225 (1.9%)	$1,486 (12.9%)	$11,961 (79.7%)	$2,013 (1%)	$58,894 (11.7%)	$74,579 (9.9%)
Classified Salaries	$7,500 (63.7%)	$8,442 (73.2%)	$384 (2.6%)		$30,757 (6.1%)	$47,083 (6.3%)
Employee Benefits					$19,489 (3.8%)	$19,489 (2.6%)
Books & Supplies	$2,663 (22.6%)	$1,300 (11.3%)	$2,000 (13.3%)	$63,042 (30%)	$79,122 (15.7%)	$148,127 (19.7%)
Services	$1,391 (11.8%)	$295 (2.6%)	$658 (4.4%)	$17,396 (8.3%)	$174,370 (34.7%)	$194,110 (25.8%)
Capital Outlay				$127,549 (60.7%)	$140,381 (28%)	$267,930 (35.7%)
TOTAL	$11,779 (100%)	$11,523 (100%)	$15,003 (100%)	$210,000 (100%)	$503,013 (100%)	$751,318 (100%)

Exhibit VII-10

Total Technology Expenditures at Project Schools by Source for 1989/90

	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High	District Administration	TOTAL
AB1470	$11,779 (73.7%)	$11,523 (72.7%)	$15,003 (75.5%)	$210,000 (85.4%)	$503,013 (83%)	$751,318 (83.2%)
District General Funds	$2,600 (16.3%)	$2,600 (16.4%)			$55,200 (9.2%)	$60,400 (6.7%)
District Categorical Funds						
Donations - Estimated Value	$1,604 (10%)	$1,724 (10.9%)	$4,866 (24.5%)	$35,782 (14.6%)	$46,976 (7.8%)	$90,952 (10.1%)
TOTAL	$15,983 (100%)	$15,847 (100%)	$19,869 (100%)	$245,782 (100%)	$602,176 (100%)	$899,657 (100%)

Exhibit VII-11A
Student Behavior Outcomes

Student Behaviors	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Fewer class absences	•• ↗		•	• →
Completion of homework	•• →		••	•• ↗
Participation in extracurricular activities	•• ↗	• ↗	••• ↗	••• →
Completion of extra tasks without being asked	•• ↗	•• ↗	•• ↗	
Higher standards of performance	• ↗	• ↗	•• ↗	• ↗
Use on non-class time for computers	• ↗	↑	↗	• ↑
Use of multi-media	↗	↑	→	↑

Student Performance Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

B. Teachers

The personal level of investment to become full participants in the project has been great. Volunteer time is common. But teachers feel energized by the new knowledge and skills they have acquired. Access to modern equipment that is typically found in more lucrative, business environments is stimulating. They've shifted to a new era of professional development. New relationship have developed with students: teacher as facilitator replaces teacher as authority. Many teachers feel their teaching is more effective and they enjoy sharing their trials and errors, joys and successes with colleagues.

C. Administrative and Other Staff

Principals report a higher level of, and more frequent communication, with parents and faculty. They say a stronger sense of leadership comes with better, more concise information, and the opportunity to alter an environment that improves teaching and learning. They also report that the promise of what can be done on site with appropriate support has been broadened. The project leadership cites evidence of change in students that has gained the attention of district leaders, who now recognize

Exhibit VII-11B
Teacher Outcomes

Instructional Method	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Direct instruction Lecturing	••• ↘	••• ↘	••• ↘	••• ↓
Teacher-student discussion	••• ↗	•• ↑	••• ↑	•• ↑
Individual instruction	•• ↗	• ↑	•• ↑	•• ↑
Cooperative learning	• ↗	↑	• ↗	•• ↑
Student-based projects	•• ↗	↑	•• ↗	• ↑
Instructional Emphasis				
Skill-based	••• ↘	••• ↓	••• –	• ↑
Content-based	••• –	•• ↗	••• –	••• ↓
Affective domain	••• ↗	•• ↑	•• –	↗
Cognitive emphasis	••• ↗	•• ↑	•• –	
Problem solving emphasis	•• ↗	• ↑	• ↑	•• ↑
Technical Emphasis				
ITV	• ↑	↑	↗	
Computer	• ↑	• ↑	•• ↑	
Audio Tape	••• –	•• –	•• –	
Laser disc	–	↗	–	
Calculator	• ↑	↗	•• –	
Camcorder	• ↑	↗	• –	
Telecommunications	↗	↗	↗	
Technical Use				
Drill and practice	•• –	••• ↘	•••	
Presentation of content	• ↑	••	••	
Application to problem solving	• ↑	• ↑	••	
Word processing	↑	↑	••	
Desktop publishing	↑	↑		
Computer aided drafting	–			
Yearbook	–			
Student newspaper	• ↑	↗		

Student Performance Prior To Project:

Blank = Not Present of Used
• = Little Presence or Use
•• = Some Presence or Use
••• = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
– = No Difference
↗ = Some Increase
↑ = Large Increase

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the difference technology can make. They also say that district leaders have developed a new sensitivity and awareness of site capabilities, leadership and skills.

Exhibit VII-11C
Administrative and Other Staff Outcomes

ADMINISTRATIVE USE	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Scheduling Classes	↗	→	*** →	*** →
Recording Attendance	↑	↑	→	*** →
Maintaining Grades	↗	↗	*** →	*** ↗
Use of Auto Dialer	↑	↑	↗	*** →
STAFF BEHAVIOR				
Sharing resources	** ↑	* ↑	* ↑	* ↑
Initiating new activities	** ↑	** ↑	* ↑	** ↑
Cross-talk about educational issues	*** ↑	* ↑	*** ↑	** ↑
Volunteering personal time training, etc.	*** ↑	↑	→	*** ↑
Feeling of collegiality	*** ↑	↑	** ↑	* ↑
Improved morale	*** →	↑	** ↑	* ↑
Helping peers	** ↑	↑	** ↑	* ↑
Learning together	** ↑	↑	** ↑	* ↑
Seeking assistance/help	** ↑	* ↑	** ↑	* ↑
Writing Grants	* →	* ↑	** ↑	** ↑

Use and Practices Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

The Monterey site reports that instructional aides have had their self-esteem greatly increased. They feel more effective because they have a more direct impact on student learning. The project has instilled professionalism in them. For clerical staff, the schools report that their sense of belonging to the school and being integrated into the total program has increased. Their professional skills have improved, and they seem to experience more fulfillment and job satisfaction.

D. Business Partnerships/Parents

The project reports that they have gained lots of marketing and public relations opportunities in addition to opportunities to test new equipment and software.

There is increased communication between parents and the school about the child's education. In addition, more parents are willing to help with technology projects at school. For example, one volunteered to produce a bilingual newsletter.

Exhibit VII-11D
Business Partnership and Parent Interaction Outcomes

BUSINESS PARTNERSHIPS	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High
Solicitation of businesses to collaborate with school	• ↗	↑	• →	• ↑
Appropriate fit between business/school agenda	↗	↗		
Number of business partners	• ↗	• ↗	•• →	• ↑
Scope of business partnerships	• ↗	• ↗	•• →	• ↑
Active involvement in project planning	↗	•• →	••• ↗	→
Active involvement in project implementation	↗	↑	→	↑
PARENT INTERACTION				
Use of parent volunteers	• →	• ↗	•• →	• →
Attendance at PTA, etc.	• ↑	• ↑	•• ↗	• →
Parent use of technology at home	↗	↗	• →	↗
Amount of parent/school contact re: instructional matters	•• ↗	• ↑	••• ↗	•• ↑
Attendance at school events	•• ↑	• ↑	•• ↗	••• ↑

Partnerships and Interaction Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

VIII. Recommendations/Comments

Suggestions for ways to improve the MTS projects were provided by MMTS staff during our discussions and were stated in the template. A summary follows:

- Waive the 10% match required by the State. Consider reimbursement of this amount for the fourth year.
- Convene the MMTS Management Team more frequently. Quarterly is insufficient. Reorganize to improve articulation of policies.
- Expand the "Super Sub" service to the high school. Add personnel to core staff to increase staff development capability.
- Publish a Framework document to illustrate how a technology-integrated curriculum is developed.
- Increase technical support from CDE. Assistance in developing partnerships and obtaining donated hardware is welcome.
- Permit the MMTS to form a 501C to pursue additional fiscal support. (recommendation from advisory team)
- Develop formal cooperative structure with other MTS projects. Continue the relationships already established.
- Develop clear and consistent State standards for research and development component across projects.
- Provide structure to use research findings in future planning.
- Design evaluation templates for future research and evaluation efforts.
- Involve the CDE office of Program Evaluation and Research in monitoring and maintaining research standards.
- Coordinate evaluation activities at the State level.
- Establish a more coordinated technology effort at the State level so "integration" is demonstrated at the top.

Chapter VIII
Hueneme Model Technology Schools Project

The data sources used to evaluate the six Level I Model Technology Schools Project include:

- the *Level I Project Self-Assessment Inventory*
- self-administered surveys for students, MTS staff, and site staff
- personal interviews conducted on site with district administrators, MTS staff, principals, site coordinators, and teachers (a total of 34 people)

A summary of the findings are presented below.

I. Background Information

A. Project Background

The Hueneme MTS project is unique in several respects. The sixth and last project to receive funding (1988), its inclusion came through a legislative rather than a competitive procurement process: the district's state legislator guided the award through the legislature. Deeply committed to the use of technology in its schools, Hueneme was a high visibility district in technology at the time. The conceptual framework for a SMART classroom (a computer-managed classroom with connected data and video applications), already developed by the district before the project, is supported by MTS funds. The design of a multi-media curriculum system is "future-oriented": the project demonstrates what is possible in technology. Project resources are concentrated in Blackstock Middle School.

Support for a strong commitment to a visionary technology plan originated among district leaders. Technology was not just another initiative--it was the thrust of an overall district plan headed by the Superintendent. Such high level support characterizes the project and is expected to continue when MTS funds terminate. The keystone of the concept, a multi-media "SMART" classroom supported by an infrastructure which connects all data, voice, and video, was already in place at one school in the district when MTS funds were received. MTS provides further support for this vision. Adherence to the vision guides the project and sharpens its focus: the project is not remolded annually as State goals shift.

The technology model envisioned by the district did not fit some of the RFP specifications to become an MTS, particularly the requirement to include a series of feeder schools to cover grades K-12. The district has involved other schools through visitations and technical assistance in installing technology, but the basic direction of the model has not been altered and virtually all project resources go to a single school, grades 6-8.

B. Project Site Demographics

The Hueneme School District is located in Port Hueneme between Los Angeles and Santa Barbara. The district is 120 years old. The total district enrollment in 1990 was 7,252 students. The district consists of two junior high schools and 9 elementary schools. The ethnic composition is: Asian (2.65%); Black (6.89%); Caucasian (28.41%); Hispanic 52.61%; Filipino (8.05%); Native American (.46%); Pacific Islander (.92%). The number of students eligible for Chapter 1 is 1,549 and the number of limited English proficient is 1,472.

Charles F. Blackstock Junior High School is the target MTS school. This junior high school serves grades 6, 7, and 8 in a suburban area. Twenty-eight teachers provide instruction to 834 students, of whom 3.72% are Asian, 6.83% are Black, 13.55% are Caucasian, 58.03% are Hispanic; 13.55% are Filipino, .72% are Native American and .72% are from a Pacific Island.

The school demographics for the Hueneme project are summarized in Exhibit VIII-1.

Exhibit VIII-1

Port Hueneme Project - School Level Demographics

	Charles F. Blackstock
Enrollment	834
Grade Levels	6-8
Percent Minority	86.4%
Percent Chapter 1	39.5%
Percent LEP	8.9%

C. Project Description

As shown in the template, Blackstock Middle School received its introduction to technology in 1983 as did many other California schools, with a gift of an Apple IIE from Apple Computer Company. During the next five years, Blackstock acquired four Wicat system labs (126 stations), cable television, eight more Apple computers, four mobile carts with TV/VCRs, and an office PC. By the summer of 1988, the SMART science classroom and the Technology 2000 lab were installed.

Data recorded on the template show that MTS project participation can be described as follows: there is active involvement by one administrator, eight teachers, three site coordinators, and three members of the clerical staff. Other school personnel are classified as indirectly involved in MTS: three administrators, 20 teachers, and six aides. Project participation by type of staff is summarized in Exhibit VIII-2.

Exhibit VIII-2

Total Staff Reporting Active Project Involvement by School* and Active Participants as a Percent of Total Staff

	Charles F. Blackstock
School Administrators	1 (25%)
Site Coordinators	3 (100%)
Teachers	8 (28.6%)
Aides	0
Clerical Staff	3 (100%)
Parents	not available
Other	

* Active involvement refers to staff who were actively implementing project administrative or instructional components during the Spring of 1991.

II. Planning and Restructuring

A school site technology planning committee is in place. The committee participated in the original proposal development and the design of the annual site plan. In the first year, members advocated in behalf of the project and participated in the evaluation, the only continuing role for the committee. In the project's second year, members provided input on changes and helped monitor project progress. The committee of site coordinators meets as needed. They also have monthly meetings with SOTA Electronics, Inc., a software development company who is the Hueneme District's partner in creating the Computer-Managed Multi-Media Classroom and will be the marketing agent for the computer-based management system and curriculum materials owned by the District.

The data in the template reveal a shift from a centralized to decentralized model, as evident in the number and level of participants in the planning process. Of the ten original participants, there were four teachers, three business partners, two district administrators, and one school administrator. The number of teachers has increased from four to 17 and the business partners from three to eight. All four school administrators are now included.

Data concerning the frequency of meetings, functions by project year, and membership for the project planning committee at Blackstock Junior High School is presented in Exhibit VIII-3.

Exhibit VIII-3

Project Technology Planning Committees	
Frequency of Meetings	as needed
Functions by Project Year	
Orig. Proposal Development	Year 1
Design of Annual Site Plan	Year 1
Advising on Project Changes	Year 2
Advocating for the Project	Year 1
Monitoring the Project	Year 2
Evaluating the Project	Year 1 and 2
Membership	
Administration/Support Staff	10
Teachers	17
Aides	6
Parents	not indicated

During the personal interviews, the Site Coordinators stated that each member of the Management Team helps Technology Planning Committees in other district schools. These committees visit Blackstock to observe classes, receive training, listen to the teachers' experiences before designing their own plans. Blackstock also sends teachers to work on-site in other schools to reconfigure classrooms and provide other technical assistance.

The Hueneme MTS places a high emphasis on six of the seven priorities addressed by the California Education Summit: enhancing the curriculum; improving high school transitions; restructuring to improve student performance; improving teacher preparation and recruitment; increasing accountability and improving assessment; and organizing effective services for children, youth, and families at risk. There is no emphasis on improving adult literacy. The Blackstock plan is written into the School Improvement Plan, which closely supports the district plan.

In rating areas of change over the life of the project, Hueneme has increased emphasis on integrating technology into the curriculum and involving parents in school activities. They anticipate continued increases in both areas for the duration of MTS. The level of business partnerships is expected to increase from now until the end of the project. As reported in another category, planning has shifted to a decentralized mode.

III. Content

The overall goal is to develop a "SMART school," a combination of electronically controlled classrooms, labs, and administrative support services which create a total interactive learning environment. Within this school, smaller communities or centers called Academic Houses group teachers and students together. For example, an Academic House in Science contains a management system that delivers courseware, maintains records, and performs other teacher-supportive functions. Another House exists for Social Studies/History. And so on. All Houses connect to the school's central office and the Instructional Management System (IMS), the heart of the concept. The long-range goal is for the IMS software package to be installed in each of the 11 district schools.

A. Curriculum

The technology has been phased in by curricular area. Science was the first, followed by the technology lab (formerly an industrial arts center), social studies, and English. Math is scheduled for 1991-92. Curriculum and content emphasis of the project are summarized in Exhibit VIII-4.

B. Staff Development

This occurs by curriculum area. One teacher in the designated area is released from teaching responsibilities to prepare the Academic House. Preparation includes: integrating the curriculum with the State guidelines; overseeing the design and installation of the physical environment; developing new curriculum materials. For example, the 8th grade English teacher described how she has used the 1990-91 school year to develop the literature curriculum for the SMART class. Her activities include: merging the State guidelines with the Prentice-Hall literature curriculum to fit the multi-media curriculum system. The Prentice-Hall curriculum fits the State framework, but does not include much application of technology. She is making the connection. She develops lessons, chooses ways to use specific technology (e.g., computers, laserdiscs, VCR or some combination) to deliver the instruction); reviews software; establishes and maintains contact with publishers and developers; creates lessons that integrate literature with other curriculum areas; helps other teachers with specific lessons; and makes conference presentations. She will resume teaching assignment in September 1991.

Exhibit VIII-4

Curricular and Process Emphasis of Project by Site	
Curricular Emphasis	
English/Language Arts	+
History-Social Science	+
Mathematics	+
Science	+
Foreign Language	-
Visual and Performing Arts	-
Health Education	-
Physical Education	-
Vocational Education	+
Other: Classroom Management	+
Content Emphasis	
Critical Thinking	+
Cooperative Learning	+
Study Skills	+
Self-esteem	+
Interest/Attitude	+

+ = Major Emphasis - = Secondary Emphasis
Blank = No Emphasis

Our interviews suggest that professional development at Blackstock has been an iterative process. The staff is aware that Blackstock is a "technology" school and that MTS is a priority. Teachers are invited to participate at their own pace. The MTS message is that everyone can use technology. The technology-proficient staff help others not to be overwhelmed. One step at a time, so teachers are not threatened. A hallmark of the technology infusion is to plan what is to be accomplished. Then teachers receive time: a few core staff were given a year's release time (described as a teacher's dream), after which they train other staff. This "grass-roots" approach seems effective. Teachers observe the benefits of using technology, listen and are encouraged by their students who want technology-connected lessons, and gradually join the team.

Teachers report that they feel and respond to the trust placed in them by the administration. The project supported a few key teachers to design and test a restructured and technological learning environment and the teachers choose how this system can facilitate the delivery of instruction.

Data presented in the template show that the MTS has supported a total of 5,500 training hours for 63 participants (42 teachers, 6 aides, 12 administrators, and 3 members of the clerical staff. Major emphasis was placed on basic orientation/introduction; instructional applications; classroom management; and office administration. Approximately 90% of the training was provided by project staff; the remaining 10% was evenly divided between business partners and outside consultants. Levels of staff involvement and training topics are summarized in Exhibit VIII-5.

Exhibit VIII-5

Project Related Training 1989/90 and 1990/91[*] Years
Total Training Hours = 5,500

Type of Participant	**Number of Participants**
Teachers	42
Aides	6
Administrators	12
Clerical	3
Parents	not indicated
Topics for Training	**Degree of Emphasis**
Basic Orientation/Introduction	Major Emphasis
Instructional Applications	Major Emphasis
Classroom Management	Major Emphasis
Office Administration	Major Emphasis

[*] Only includes training on through March of 1991

C. Learning Resources Management

The resources are on-site. Each classroom is equipped with the necessary hardware to use video tapes, laserdiscs, CDs, software, and cable television. The resources are described by participants as "abundant."

Teachers review the software, typically taking advantage of the 30 day trial period provided by most vendors. Teachers who attend workshops or professional conferences have latitude in recommending purchases.

D. Dissemination

Educators at all levels participate in dissemination activities, as described by the participants. The Superintendent and the Project Director represent the project (locally, nationally, and internationally) as a keynote speaker and he personally responds to inquires and requests for technical assistance (e.g., teleconference with educators from Stanford, CT) from other districts. They involve other key members of the staff. For example, the Social Studies and Technology Lab resource coordinators make presentations (at Educational Technology meetings) on how they used their release time, the new configurations in their classes, and why as teachers, they are very excited about technology.

Both products and services are ready to be disseminated, as reported in the template. To date, 200 implementation manuals, 400 videos, and 175 books on restructuring the class and curriculum have been distributed. Other products and services nearing completion are: curriculum manuals, evaluation materials, and curriculum units. Staff proficient in training others on technology use and planning and curricular integration are available.

Word about the project also spreads through staff meetings within Blackstock, to other district schools, and outside the district. Twenty conference presentations have been made, and 34 articles have been published. One unique feature of the dissemination process occurs through the business community. Contractors with whom the staff have collaborated (GTE, IBM, SOTA Electronics, Creative Learning, Edunetics) advertise their new products in professional journals.

This is a very visible project. The pre-MTS installation of the first SMART classroom attracted the attention of the local State Representative, the Governor and the Secretary of Education. Early publicity was overwhelming because of the interest and curiosity it generated. Eventually, a visitation process that accommodated program needs was established. By March 1991, the data show that 1,671 educators, 886 business and industry representatives and 31 foreign guests had visited the project.

Project-wide dissemination activities are summarized in Exhibit VIII-6.

E. Evaluation

The University of Southern California is the independent evaluator. The research director meets weekly with MTS management to give and receive progress reports, provide feedback to the implementation and describe forthcoming research activity. A written evaluation report is submitted weekly and circulated among project participants.

The information in the template describes the research design as comprised of several components. The summary evaluation component includes a longitudinal analysis of CAP scores, but offers no causal relationship to the MTS. These scores are being reported because of an inferred requirement by State educators and other policy-makers. Instruments and procedures include those designed to measure critical thinking (grades seven and eight); student attitude survey; telephone interviews of randomly selected parents from high, middle and low GPA students (total of 75 parents); classroom observation of project and non-project students; analysis of MTS in relation to student attendance, discipline and GPA; cost analysis of facility development in addition to the hardware and software costs; review of authentic assessment in randomly selected elementary classes and the Technology Lab; an expanded study of "time-on-tasks;" and a visitor's survey.

Exhibit VIII-6

Summary of Dissemination/Marketing Activities for the Port Hueneme Project

Total Developed through Project	In Progress	Ready to Disseminate	Already Disseminated Sold/Donated
Products	0	5	775
Services	0	2	0
Total Activities for Disseminating Information	In-School	In-District	Out-of-District
	44	40	79
Total Visitors to the Project	Years 1 & 2	Year 3	Year 4
	872	941	775

The research director comments on the research design and offers suggestions for consideration by the MTS management. One difficulty is in attributing a causal link between the MTS and CAP scores. Too many environmental and developmental factors may influence the scores. The evaluation reports sensitivity to "overtesting" and is attempting to limit this to those of most use to the project. With respect to formative evaluation, the research director raises issues that are being discussed with MTS management and which he considers potentially useful: for example, a cost analysis per student; an examination of student learning styles in and out of technology-rich environments; and a comparison of "time-on-task" between students in technology-based classrooms and those without the benefit of technology. Teacher suggestions for instructionally-useful information (effective tutorial programs) and their comments on data-collection procedures in place are requested.

As the section of the Self-Evaluation Survey on most important survey findings by year was not completed, table VIII-7 is omitted from this chapter.

IV. Program Implementation

Blackstock Junior High School - The template states that three SMART classrooms are installed: Science, History/Social Studies, and Literature/English. The fourth (Mathematics) will be the focus during the 1991-92 school year. The instructional delivery in visual and performing arts is enhanced through VCRs, video production equipment, and camcorders. The Art Department acquired laserdiscs of the complete library of prints from the National Arts Museum. These are being incorporated into the art curriculum, using software developed by District educators. The music program is enhanced through electronic keyboarding, CD players, MIDI interfaces, and sound digitizers. A mini-SMART classroom has been created for ESL students and those with limited English proficiency.

The school is enriched with computers in several settings: 64 computers in laboratory environments and 64 connected to CAI labs; 354 in classrooms; 20 checked out to teachers; 4 in teacher workrooms; 3 checked out to students; 3 in the library; and 3 checked out to parents. Eighty-seven percent of the classrooms have at least one computer. Approximately 40 percent of all the technology was purchased with project funds. Forty VCRs are housed in classrooms while four are available on mobile carts. Laserdisc players are in 27 classrooms and available in three other rooms. In addition, the National Television Network provides 10 portable keyboards, located in a sixth grade classroom.

Parent involvement activities include: participation in a School Effectiveness Survey whose findings were used to plan learning activities; membership on school site council which approves a school plan and authorizes budget expenditures; and newsletters to parents.

The SMART classroom configuration is detailed in the promotional brochures. Briefly, a multi-media curriculum system consists of a file server, a teacher workstation, student workstations, specially designed (SOTA) video devices. Each student workstation contains five IBM clones, a MacIICX, an Apple IIGS, a Sony 20" multi-synch monitor, a laserdisc player, a VCR player. The Intelligent Management System (IMS) software allows switching of the individual workstations from computer output to television output. Other audio video resources may be routed from any audio-video device at the teacher workstation to any individual or group of student workstations. The audio/video materials can come from multiple sources -- a satellite dish, CATV, VHS tape player, laser videodisc player and video camera. Exhibit VIII-8 summarizes the emphasis in various types of technology at Blackstock.

Exhibit VIII-8

Types of Technology Use	
Computers	+
Laserdisc/Interactive Video	+
Instructional Television (ITV)	+
Audio/Video Production	-
Satellite downlink for ITV reception/distance learning	-
LCD Panels, Video Projectors	-
CD ROM	-
Technology for the handicapped	-
Science Lab Equipment	-
Calculators	-
Telecommunications	-
Music	-

+ = Major Emphasis - = Secondary Emphasis
Blank = No Emphasis

Although Blackstock is the only MTS school in Hueneme, the district is given to point out that designated other schools and neighboring districts have benefitted from this project. At Larsen Elementary School the District installed a computer managed multi-media classroom, i.e., the Smart-Classroom, which has become the trademark for the Port Hueneme Educational Technology Program. Prior to the installation of the Larsen Smart-Classroom, the MTS resources developed at Blackstock Junior High School were shared with Larsen teachers and directly influenced the decision to install a Smart-Classroom.

The District also installed a mini Smart-Classroom equipped with multi-media electronics at Bard Elementary School. Again, as a result of the discussion with MTS personnel from Blackstock Junior High School, computer managed multi-media electronics have become a focus at this school.

All of the above projects received direct and indirect support from Port Hueneme's MTS project. In the case of Larsen, Bard, and Williams Elementary Schools, the district has contributed approximately $220,000. The new technology developed at Blackstock was also transferred to E.O. Green Junior High School. All of these projects were impacted by the resources that were developed by the Level I project at Blackstock.

Port Hueneme is also involved with the Oxnard Union High School District began in 1989-90. Throughout 1989-90 inservice programs were conducted by Port Hueneme MTS staff in the areas of science, technology lab, and United States history. Substitute teachers and all teacher released time for these inservice activities were funded by the Port Hueneme MTS Project.

V. Support Resources

This project receives and seems to thrive on the support from the leadership on site and in the district office. Teachers, resource coordinators, and participants at all levels state that they feel they are contributing to something special. Learning how to use technology effectively has rejuvenated their teaching, altered their perspective on students' potential, and improved collegial relationships.

The Project Director reports that he needs and receives the highest level of support from the galaxy of offices involved in MTS -- the school, project, and district administration, California Department of Education, parents, and business partners.

In our interviews, the district leadership described its continuing commitment to take a pro-active stance for technology-linked instruction. MTS supports and advances an existing District vision: The commitment and enthusiasm to fulfill the vision when MTS funding ends is clear.

The Superintendent recognizes the risk and uncertainty of depending on external resources to support the district's technology plan, and is embarking on an entrepreneurial approach to sustain the initiative. A foundation is being formed to produce and market the products and services being developed. The incentive is twofold: one is to disseminate products and services beyond the life of MTS and the other is to generate funds to install an Intelligent Management System throughout the District. One potentially marketable product is the "switching" management software that converts commands from the teacher workstation to control commands for the laserdiscs and VCRs, the master audio/video unit, and the local audio/video unit in student workstations. Other products include: a vocal bell system developed with a firm from Bulgaria; the design of the SMART classroom; and an Intelligent Management System that serves all administrative functions from the central office. A portion of the revenue is expected to be returned to the foundation for continued research and development. Some amount will also be returned to the creators: either the companies or the teacher-developers. The structure of the foundation is now being conceptualized. Although its potential is uncertain, one clear rationale for pursuing an entrepreneurial path is independence. Technology-based linkages to business and industry are costly to a district as software and hardware changes may force expenditures for upgrading that are difficult to meet.

The Superintendent is collaborating with the California Lutheran College, UCLA, USC, UC Santa Barbara, and the Offices of Education in Santa Barbara, Ventura and Fresno counties to establish teacher training centers. In early 1991, one of the teachers who was given a year of release time to develop the computer managed multimedia classroom, conducted training at Blackstock for at least 20 participants. A summer training institute is also scheduled at UCLA for students from Taiwan.

VI. Funding Support

The information in the template describes the basis on which Port Hueneme has distributed project funds. The original proposal stated that the bulk of the resources would target Blackstock School. The presence of only one other junior high school in the district has resulted in an effort to establish parity between the two schools. The allocation of resources stems from the interest and need expressed at the other school.

Exhibit VIII-9 summarizes AB1470 technology expenditures for Blackstock school and for project-related district-level administrative and support activities for the 1989/90 school year. This is followed by Exhibit VIII-10 which presents technology expenditures at the project school and for project-level administration and support from all sources.

VII. OUTCOMES

A. Students

An improvement in student behavior is reported from several perspectives. Student attendance has increased and student suspensions have decreased; overall GPA and completion of homework is up; more students pass the district's proficiency tests, especially in written expression; more students participate in the school science fair and win in the district science fair; and for the first time, Blackstock is represented in the county and state science fairs. Student outcomes are summarized in Exhibit VIII-11A.

B. Teachers

Changes in staff behavior are reported as being dramatic. Positive shifts in teacher enthusiasm, commitment, morale, cooperation appear in classroom observations, teacher surveys, and use of personal time.

Exhibit VIII-9

AB1470 Technology Expenditures for 1989/90	
	TOTAL
Certified Salaries	$81,731 (6.8%)
Classified Salaries	$21,505 (1.8%)
Employee Benefits	$18,748 (1.5%)
Books & Supplies	$71,207 (5.9%)
Services	$161,417 (13.4%)
Capital Outlay	$852,728 (70.6%)
TOTAL	$1,207,336 (100%)

Exhibit VIII-10

Total Technology Expenditures at Project Schools by Source for 1989/90	
	TOTAL
AB1470	$1,207,336 (53%)
District General Funds	$477,759 (19%)
District Categorical Funds	$575,110 (25%)
Donations - Estimated Value	$58,000 (3%)
TOTAL	$2,318,205 (100%)

Exhibit VIII-11A
Student Behavior Outcomes

Student Behaviors	
Fewer class absences	** ↑
Completion of homework	** ↑
Participation in extracurricular activities	** ↗
Completion of extra tasks without being asked	** ↗
Higher standards of performance	** ↑
Use on non-class time for computers	** ↑
Use of multi-media	** ↑

Student Performance Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

MTS reports progress in instructional areas where there was little prior activity. For example, large increases are reported in instructional methods that involve teacher-student discussion, individual instruction and strategies such as cooperative learning. Gains are also reported in higher-order thinking skills and the affective domain. The project has led to increased use of ITV, the personal computer, laserdisc, and camcorder. Except for drill and practice, technical use has vastly increased in all areas (e.g., desktop publishing, computer aided drafting, presentation of content).

C. Administrative and Other Staff

The administrative package (Instructional Management System) is not fully installed, although staff report improvement in scheduling, attendance, maintaining grades and the use of an auto-dialer.

Substantial gains in all categories of staff behavior, other than grant writing, are reported for this project.

Exhibit VIII-11B
Teacher Outcomes

Instructional Method	
Direct instruction/Lecturing	••• ↓
Teacher-student discussion	•• ↑
Individual instruction	•• ↑
Cooperative learning	• ↑
Student-based projects	•• ↑
Instructional Emphasis	
Skill-based	••• ↓
Content-based	••• ↗
Affective domain	•• ↗
Cognitive emphasis	•• ↑
Problem solving emphasis	•• ↑
Technical Emphasis	
ITV	• ↗
Computer	•• ↑
Audio Tape	–
Laser disc	• ↗
Calculator	•• –
Camcorder	• ↗
Telecommunications	–
Technical Use	
Drill and practice	•• ↓
Presentation of content	•• ↑
Application to problem solving	• ↑
Word processing	• ↑
Desktop publishing	• ↑
Computer aided drafting	•• ↑
Yearbook	↑
Student newspaper	• ↑

Student Performance Prior To Project:

Blank = Not Present of Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
– = No Difference
↗ = Some Increase
↑ = Large Increase

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Exhibit VIII-11C
Administrative and Other Staff Outcomes

ADMINISTRATIVE USE	
Scheduling Classes	→
Recording Attendance	↗
Maintaining Grades	• →
Use of Auto Dialer	↗
STAFF BEHAVIOR	
Sharing resources	• ↗
Initiating new activities	• ↗
Cross-talk about educational issues	• ↗
Volunteering personal time training, etc.	• ↑
Feeling of collegiality	• ↗
Improved morale	•• ↗
Helping peers	• ↑
Learning together	• ↑
Seeking assistance/help	• ↑
Writing Grants	•• →

Use and Practices Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

D. Business Partnerships/Parents

Formal business partnerships in product development were established with MTS. The opportunity to participate in a pioneering educational enterprise was equally attractive from a marketing perspective. These cooperative ventures have produced special curriculum products and delivery systems. Professional development for both district and industry employees involved in these original designs has occurred.

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More parents attend PTA and other school events since the emphasis on technology. Prior to this, Back-to-School nights and Open Houses were sparsely attended. In 1990, the Blackstock Middle School Open House hosted the largest parent turnout in the school's history. Similar attendance was reported for the 1990 Back-to-School event as students proudly showcased their capability to use the technology.

The sources of information used to complete this site visit were the template (completed by the Project Director, the District Finance Account Supervisor, a District Administrator, and the Evaluation Director) and information collected during the on-site interviews (from district administrators, MTS staff, principal, resource teachers, and regular teachers).

Exhibit VIII-11D
Business Partnership and Parent Interaction Outcomes

BUSINESS PARTNERSHIPS	
Solicitation of businesses to collaborate with school	• ↗
Appropriate fit between business/school agenda	→
Number of business partners	•• →
Scope of business partnerships	•• →
Active involvement in project planning	••• ↗
Active involvement in project implementation	••• ↗
PARENT INTERACTION	
Use of parent volunteers	• →
Attendance at PTA, etc.	• ↗
Parent use of technology at home	not indicated
Amount of parent/school contact re: instructional matters	• →
Attendance at school events	•• ↗

Partnerships and Interaction Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

VIII. Recommendations/Comments

Suggestions for ways to improve the MTS project were provided by Hueneme MTS staff during our discussions and were stated in the template. A summary follows:

- The Research and Evaluation requirements are somewhat excessive. Even though legislation specifies this, we may be overdoing it. Each of the Level I projects is spending anywhere from $75,000 to $100,000 on an annual basis; or roughly 20% of the yearly budget. Including this project-wide evaluation, a lot is being spent on research and evaluation. These dollars could buy a lot of hardware and software of all types, which could have been available for students.

- The present structure that we have in place is working fine. Our project is teacher driven, and the teachers have been empowered with the whole project. All personnel from the district level now work very closely with site teachers and site principals. The superintendent has established a close working relationship with all parties directly involved in the project. Decision making is done in an open discussion style with all parties concerned. All parties work together.

- Staff development continues to play a vital part of the project since the role of the teacher has changed significantly. Effective staff development can be costly because it requires teacher time. Therefore, a major portion of the MTS funding should be earmarked for intensive efforts in this area. Staff development differs from inservice programs and requires longer periods of teacher released time to be effective. Technology teachers need to become specialists in their own particular areas. This requires on the job training, released time or a combination of both. The development of a core of expert technologists has happened at Hueneme. These teachers then teach other teachers and are available for support and training. This almost one to one training has resulted in the growth of interest in technology throughout the district.

- Alignment with State Curriculum Frameworks is a time consuming task, but one that is absolutely necessary. It would be nice to have available "hardcopy" similar to the old Tech Guides on all pieces of software. With the Tech Guides came suggestions on use and alignment with State Frameworks. I am not sure which agency should be responsible for doing this.

- We are not sure that technical support is available, because what we are doing in some of our SMART classrooms has not been done before.

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- MTS funds were not enough for what we wished to accomplish. Therefore, we have used SIP, Chapter, Lottery and General funds to support and expand our technology programs throughout the district.
- Dissemination at the local level has been the best method for us. Perhaps CDE could do a little more to assist in this regard.

Chapter IX
Sacramento Model Technology Schools Project

The data sources used to evaluate the six Level I Model Technology Schools Project include:

- the *Level I Project Self-Assessment Inventory*
- self-administered surveys for students, MTS staff, and site staff
- personal interviews conducted on site with district administrators, MTS staff, principals, site coordinators, and teachers (a total of 34 people)

A summary of the findings are presented below.

I. Background Information

A. Project Background

The driving force behind Sacramento's original proposal was the previous superintendent. His commitment to technology was reflected in the policy, instituted in 1985 that all categorical funding programs in the district must include a technology component. He also added a one-half time technology coordinator at the district level.

The proposal team included an outside consultant who wrote a book on technology, the Project Director, the District Administrator of Curriculum and Instruction, and 20-30 local educators/advisors who represented curriculum, instruction, and training. One who contributed to the vision was the Principal of the first implementation school. The Project Director was then Vice Principal at Burbank High School and had successfully competed for an AB803 grant to build technology into a math/science program and who taught computer science at the high school. She coordinated and conducted meetings of these educators to develop a vision of technology and to generate input for the proposal. She was selected as the Project Director after the award was announced in October 1987. Her appointment was a signal that curriculum would drive the technology.

B. Project Site Demographics

The evaluation template contains the following data about the district. The total district enrollment in 1990-91 is 49,453. The highest percentage of students are Caucasian (35.2) with approximately an equal number of Asian (23) and Black (22) and Hispanic students (19). Less than 2 percent are Native American. Almost one-third are eligible for Chapter 1 services and about 20 percent of the students are limited English proficient.

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The MTS project includes three schools:

Edward Kemble Elementary School (K-6) is located in south Sacramento with an enrollment of 838 students. The dominant student population is Hispanic (31%) followed by Black (26%). The Asian and Caucasian populations are about equal (21% and 22% respectively). Less than 1 percent of the student population is Native American. Approximately 60 percent of the students are eligible for Chapter 1 services: 30 percent are Limited English proficient. Kemble hosts bilingual, special education, Chapter I and SIP programs.

Charles M. Goethe School (7-8) student enrollment of 637 in 1990-91 was almost twice as many as the previous year. Both teachers and administrators describe the school's dramatic comeback through MTS and other attractive programs such as math/science and technology magnet, Chapter I, Community of Caring, and Special Ed. School data on the template show that approximately 45 percent of the students are Black, with almost equal numbers of Caucasian, Asian, and Hispanic students. Less than 1 percent are Native American.

Luther Burbank High School (9-12) enrolled 1,639 students in 1990-91. The ethnic distribution of students is Black (37%), Asian, (27%), Caucasian and Hispanic (18% each) (no page 3 on project participation in template). This school also hosts a magnet program (Academy of Math, Science and Engineering), a naval ROTC program, programs for LEP, and special education.

The school demographics for the Sacramento project are summarized in Exhibit IX-1.

Exhibit IX-1

Sacramento Project - School Level Demographics

	Edward Kemble Elementary	**C.M. Goethe Middle**	**Luther Burbank High**
Enrollment	838	637	1,639
Grade Levels	K-6	7-8	9-12
Percent Minority	78.1%	80.5%	81.9%
Percent Chapter 1	61.7%	55.7%	14.6%
Percent LEP	32.8%	15.8%	21.4%

C. Project Description

We learned during the interviews that the district administration is concerned with students at-risk and view technology as an opportunity to reach this population and improve their performance. The template states that the minority student population in each school is close to 80 percent.

When MTS arrived at Kemble, the school had 6 computers used by three teachers. Now the Principal, 100 percent of the teachers (33), 50 percent (8) of the aides, and 100 percent of the clerical staff are actively involved in MTS. Students in all grades are served by the project.

Both project and school personnel reported that start-up was delayed in this first implementation school because of revised designs in the capital improvements required to install a school-wide network, acquisition of the hardware and the necessary adjustments to the staff development schedule. The system became operational in January 1989.

At C.M. Goethe Middle School, the current administration and faculty came to Goethe less than two years ago and are all actively involved in the project. The combined support of MTS, an IBM Networking Teachers project and the Magnet Program permitted school-wide networking since 1988-89. The school's growing reputation in technology attracts students throughout the district.

Project and school staff report that implementation began at Burbank High School in 1989-90 with capital improvements, hardware installation and preliminary training. When completed,the MTS school-wide networking and establishment of an Information Center will complement six existing computer laboratories and a technology program for orthopedically handicapped students. In early 1991, 62 teachers received one-half day of training to use the system.

Project participation by type of staff is summarized for each school in Exhibit IX-2.

II. Planning

Project personnel informed us that the technology vision for the district was formed under the previous administration. The MTS award helped convert a portion of the Superintendent's dream into reality. The MTS conceptual approach is a school-wide network at each site, and ultimately link all project schools. The commitment to school-wide networking has delayed the implementation in each school because the design and installation of the system has been a learning process in reconfiguring classrooms, ordering equipment and other materials, experiencing installation delays, and altering training schedules. However, the lessons from the MTS experience are believed to guide the planning for new adoptions in other district schools.

Exhibit IX-2

Total Staff Reporting Active Project Involvement by School* and Active Participants as a Percent of Total Staff			
	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
School Administrators	1 (50%)	2 (100%)	2 (50%)
Site Coordinators	1 (100%)	1 (100%)	1 (100%)
Teachers	33 (100%)	40 (100%)	24 (32%)
Aides	8 (47%)	4 (100%)	0
Clerical Staff	4 (100%)	6 (100%)	0
Parents	not available	not available	not available
Other		1 (20%)	

* Active involvement refers to staff who were actively implementing project administrative or instructional components during the Spring of 1991.

Nine federally supported magnet schools stimulate the spread of technology in the district. The link within the district is the Project Director. She is a planning resource to non-MTS schools in the district. In addition, improvements in planning and scheduling in other district departments such as maintenance and purchasing reflects the MTS experience.

Fulfilling the district plan to infuse technology occurs in two other ways: the first is through a Technology Training Grant obtained with the help of the MTS Project Director, but operated from a separate office. In the summer of 1991, 60 district teachers will receive technology training, according to one of the teachers we interviewed. The enrollment reflects increased teacher interest in technology use and use of a cadre of trained MTS. MTS teachers are trainers in the summer institutes. We learned about a second infusion from the district administrator of the Office of Curriculum and Instruction that the MTS training coordinator will join the staff before June 1991.

Data in the template show that district-level planning for the MTS project has become more decentralized. More than 20 district administrators were involved in planning at the beginning of MTS. Three currently participate. However, teacher participation has increased, especially at the middle school. The principals meet with the MTS staff to evaluate accomplishments from the project and to gain site perspectives. School staff prioritized needs and establish annual project direction within site-specific budgets. Site-based planning may be influenced by the infusion of other funds designated for technology use.

Both the school-based interviews and the template report that each project school has a site planning committee that designs, oversees, and advises on project changes. The high school group meets monthly and focuses on areas from design to evaluation. Technology Use Plans (TUP) are incorporated into other plans (e.g., magnet, Chapter I). The existence of a district TUP is unclear: One site indicates the lack of such a TUP while another reports that its school plan incorporates some TUP district planning elements. All project schools indicate gains over the life of the project in the following areas: technology integration into the curriculum; parent involvement; business partnerships (high school and middle school) and a shift from centralized to decentralized planning.

Data concerning the frequency of meeting, functions by project year, and membership for the project planning committees at each site are presented in Exhibit IX-3.

Exhibit IX-3

Project Technology Planning Committees			
	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Frequency of Meetings	as needed	as needed	Monthly
Functions by Project Year			
	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Orig. Proposal Development	not involved	Year 1	Year 1 and 2
Design of Annual Site Plan	Year 2 and 3	Year 2-4	Year 1-4
Advising on Project Changes	Year 2 and 3	Year 3 and 4	Year 1-4
Advocating for the Project	not involved	Year 3 and 4	Year 1-4
Monitoring the Project	Year 2-4	Year 3 and 4	Year 3 and 4
Evaluating the Project	not involved	not involved	Year 1-4
Membership			
	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Administration/Support Staff	7	9	4
Teachers	30	18	7
Aides	8	4	0
Parents	not indicated	0	0

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III. Content

A. Curriculum

Project participants generally reported that the curriculum drives the technology. In our interviews and in the visitors' materials, we learned that the curriculum area that receives the major emphasis at all three schools is English/Language Arts. Major curriculum emphasis at two schools includes: mathematics, science and visual/performing arts. Instructional strategies for specific applications vary by and within each school. For example, at Kemble, teachers cooperate in grade level teams to develop thematic units that align with the state framework: The site coordinator provides technical assistance in identifying software and preparing the units. In the middle school, Microsoft Works is used across the curriculum, and teachers integrate technology in all subject areas. The high school teachers will be gradually integrated by departments: Math and social studies received attention early in the implementation, and in 1990-91 the language arts department was added. The curricular and content emphasis of the project are summarized by school in Exhibit IX-4.

B. Staff Development

Teachers report limited satisfaction with the staff development effort. The award of the Technology Training Grant resulted in a loss to MTS because its Training Director headed the new project. The MTS Project Director expected that MTS would receive one-half of the training offered. This has not happened. Much of the responsibility for training rested with school personnel, such as the Site Coordinator and trained teachers. In fact, MTS staff often serve as trainers of courses offered by the Training Grant.

The delays in equipment acquisition and installation contributed to adjustments in the training schedule. For example, the Kemble staff describes the first year's training at Kemble as non-technology based (e.g., cooperative learning, developing critical thinking skills). There was a high staff turnover at Kemble because many teachers declined the challenge of implementing too many new initiatives simultaneously. The school became a magnet school the same year MTS was awarded. Much of the orientation and training occurs one-on-one. This year a four-day training session was conducted for all new teachers.

The Goethe staff stated that training began slowly because only a small number of teachers responded to the invitation to participate. Staff development occurred in small groups, using systems such as Josten's Learning Corporation packages and IBM Basic Skills software. All teachers are now on board and train one another. They all use Microsoft Works, spread sheets and send weekly progress reports to parents. In 1990, the school sponsored a computer enrichment program attended by 120 students. They are overcoming the biggest implementation obstacle -- making people feel secure with the hardware and software.

Exhibit IX-4

Curricular and Process Emphasis of Project by Site			
Curricular Emphasis	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High School
English/Language Arts	+	-	+
History-Social Science	-	-	+
Mathematics	+	+	+
Science	-	+	+
Foreign Language		-	-
Visual and Performing Arts	-	-	+
Health Education		-	
Physical Education		-	-
Vocational Education		-	+
Other: Engineering			+
Content Emphasis			
Critical Thinking	+	-	+
Cooperative Learning	+	-	+
Study Skills	+	-	+
Self-esteem	+	+	+
Interest/Attitude	+	+	+

+ = Major Emphasis - = Secondary Emphasis Blank = No Emphasis

The high school coordinator describes training which began in 1990-91 with a two-day workshop on word processing for the language arts teachers. Several teachers expressed interest in better orientation to MTS so they can better understand and visualize the potential of technology. They reported a lot of apathy among teachers when initially invited to join MTS. In the Spring of 1991, the information center hosted an open house/inservice to all faculty. About 20% of those attending scheduled class sessions in the center. Although the teacher is in charge of the class when using the Center, the site coordinator is available. However, this position will be eliminated in the fall 1991 and teachers are concerned about the void this will create.

The template shows that in 1989-90, 201 training hours were provided to 664 teachers plus 32 aides, administrators, clerical staff and parents. In 1990-91, the number of training hours dropped to 69 for 155 persons. Training focused on basic orientation, instructional applications, and office administration. Classroom management was of secondary concern. Almost 75% of the training is given by project staff, followed by 22% from other district staff. Business partners offered 5 %. The Director of the Training Grant and the MTS Curriculum report several special training characteristics. In the template, they state "Seed-training those interested . . . their influences sparks the interest of their originally reluctant peers. Trainers of Trainers strategy. . . in-house training of staff. . .substitute release time training." Levels of staff involvement and training topics are summarized in Exhibit IX-5.

Exhibit IX-5

<table>
<tr><th colspan="2">Project Related Training 1989/90 and 1990/91* Years
Total Training Hours = 270</th></tr>
<tr><th>Type of Participant</th><th>Number of Participants</th></tr>
<tr><td>Teachers</td><td>788</td></tr>
<tr><td>Aides</td><td>7</td></tr>
<tr><td>Administrators</td><td>10</td></tr>
<tr><td>Clerical</td><td>44</td></tr>
<tr><td>Parents</td><td>2</td></tr>
<tr><th>Topics for Training</th><th>Degree of Emphasis</th></tr>
<tr><td>Basic Orientation/Introduction</td><td>Major Emphasis</td></tr>
<tr><td>Instructional Applications</td><td>Major Emphasis</td></tr>
<tr><td>Classroom Management</td><td>Secondary Emphasis</td></tr>
<tr><td>Office Administration</td><td>Major Emphasis</td></tr>
</table>

* Only includes training on through March of 1991

C. Learning Resources Management

The management of resources at Sacramento relates to the conceptual framework of this project -- networking at least one computer in every classroom to all other classrooms. As reported by MTS staff, a networking system has the capacity to facilitate teacher's computer applications by providing access to common software, increasing the exchange of instructional strategies, and exposing students in different locations to the same resources. Teachers are relieved of handling a variety of materials and can easily communicate with one another through electronic mail.

According to the information provided in the template, the project has improved the management of learning resources by centralizing all software through the networking configuration, all computer software in the school is available in every classroom through the network, and increased collaboration among the teachers spreads knowledge about available materials.

The procedures for reviewing technology-based learning resources, as described in the template include: alignment of software and other resources with the State frameworks; grade level and content appropriateness; curriculum alignments; networkability; emphasis on problem-solving and critical thinking.

D. Dissemination

As described in the template, the products and/or services prepared for dissemination include: eight curriculum units designed for teacher use; a guide for selecting secondary-level software. Other products have been disseminated: an implementation manual for district administrators; three videos for teacher use; one curriculum unit; a staff development package for trainers; an informational packet on the MTS project for district use. According to the evaluator, any product or practice that is formally disseminated will be reviewed by teachers at the same grade or subject area and by members of the MTS team.

Disseminating information about MTS occurs in a variety of ways: in-school staff meetings; 20 out-of-district conference presentations; 15 in-district and three out-of-district workshops; six journal articles; one television spot and more than 50 site visits, almost exclusively out-of-district. Business partners provide occasional dissemination forums, as does the California Technology Project.

The most successful strategy reported is the site tour. Visitors from inside and outside the district receive personally guided tours of the schools, observe classrooms, address specific concerns to teachers and administrators. As of April 1991, 275 people toured the Sacramento project. However, only two visor surveys covering the period January through May 1991 were returned in conjunction with this project.

According to the MTS and Goethe staff, there is some MTS spinoff in the district. The Goethe team (3) has provided the technical assistance necessary to avoid duplicating mistakes at Einstein, another district middle school. MTS experience will benefit the entire district in two additional key ways: the former training coordinator now heads the technology training office and the former curriculum coordinator now works in the office of Curriculum and Instruction. Both enhanced their technology expertise on MTS in ways that will now potentially benefit the entire district.

Project-wide dissemination activities are summarized in Exhibit IX-6.

Exhibit IX-6

Summary of Dissemination/Marketing Activities for the Sacramento Project			
Total Developed through Project	In Progress	Ready to Disseminate	Already Disseminated Sold/Donated
Products	8	0	7
Services	0	1	0
Total Activities for Disseminating Information	In-School	In-District	Out-of-District
	17	30	86
Total Visitors to the Project	Years 1 & 2	Year 3	Year 4
	65	150	60

E. Evaluation

The MTS Director chose to use the district Research and Evaluation office to meet the state requirement for an evaluator. Researchers from Sacramento State and UC Davis serve on a research advisory committee and assist with evaluation design. While the value of an evaluation component is accepted, the MTS staff state they would probably have reduced the scope of the effort. The original research design was too ambitious and annual modifications have been made. For example, some of the original research questions were modified to exclude the studies relative to development of thinking skills and cost analysis. In the third year, the Coordinator added research questions linked to the effectiveness of the classroom technology configuration and in the fourth year, to study the effectiveness of the dissemination strategies. A committee of teachers and MTS staff will review products to be disseminated. Following the fifth project year, a survey of a sample of users will be conducted.

As stated by the Research Coordinator (in the template), the research agenda focused on summary studies, as advised by the committee. Although moderate emphasis was placed on a formative agenda, the research findings have resulted in annual program modifications.

Some of the most important research findings and resulting program modifications, as described by the research team, are summarized in Exhibit IX-7. The most important instruments used are: teacher surveys; writing samples; standardized tests; student affective measures; classroom observations.

Exhibit IX-7

Research Findings by Evaluation Team and Program Modifications by Year

Year	Finding	Program Modification
1	A. Teachers needed more time to learn/apply technology skills. B. It took much longer to implement the program than anticipated. C. Having too many programs at the same site during the same year overwhelmed teachers with the requirements and activities.	A. Modified training program. B. Modified program schedule and adjusted activities to allow more time. C. Need for future planning.
2	A. Need for on-going technology support for teachers. B. Difficulty in sharing configured classrooms.	A. Provided a technology resource teacher at the Information Center at each school. B. Adjusted/rearranged technology set-up. Set priority for using Information Center.
3	A. The level of technology used depends upon the availability of technology and the convenience of use. B. Success in involving teachers in the program and a positive perception of teachers toward technology at elementary and middle schools.	A. Provided more equipment. Tried to connect all classrooms with the Information Center. B. Applied the same strategies at high school to involve teachers.
4	A. Positive impact on students' attitudes and behavior at elementary level, but the impact on achievement was inconclusive. B. When technology was used, students were more on task in classes.	A. Recommended to allow more time for student achievement.

IV. Project Implementation

Decentralization permits tailor-made implementation plans for each school. Although decisions for curriculum emphasis and types of technology used are school-based, some commonalities across the schools exist, as shown in the responses on the template. For example, each of the three schools reports major emphasis school-wide in using technology in the curriculum; restructuring instructional settings; restructuring governance; and improving the school climate. The major types of technology selected by all three sites are: computers; science lab equipment; and calculators. The major types of software selected by all three sites are: word processing/desktop publishing; Integrated Learning Systems; Hypermedia/multimedia/Database, spreadsheet, other business software; plus other instructional software (not including CAI or ILS). The elementary and middle schools have equipped all their classrooms with at least one computer: about 25 percent of the high school's classrooms contain at least one computer.

A. Kemble Elementary School

According to MTS staff, this school was selected as an MTS site because of it's high minority population and the district priority to target at-risk students in this project. Implementation was interrupted by several factors such as the high staff turnover, as described by a few on-site staff. One-half of the teachers were riffed just prior to project start-up. Most staff left because of staff cut-backs and others because too many new programs placed too many demands on their personal time. The site coordinator is the only teacher at the school that has been part of the project since its inception. New teachers reported difficulty assimilating into the project.

The interviews with the teachers suggest that the network is not fully installed. All capital improvements are being made by district staff. It has taken 3 1/2 years and is still not done. Some of the staff that were interviewed seemed to lack much energy or enthusiasm for taking advantage of the networking system. The district maintenance staff seems overtaxed to handle the demands of MTS. Teachers work in grade-level teams to develop technology-based curriculum units, but the interviews suggest widespread use of these units remains a goal. Planning occurs at full-staff meetings. The Principal requested staff input regarding the use of MTS year 5 funds, and she meets regularly with teams. Teachers with no technology in their classes have priority use of the Information Center, although several choose not to use it. The site coordinator is paid with magnet funds that terminate in June, 1991. The future for this role is unclear.

As stated in the template, Kemble has 19 computers in a lab setting, 76 in classrooms, and four in administrative offices. Other technology used includes VCRs on carts and in classrooms, plus 16 printers.

B. Goethe Middle School

The staff interviewed at Goethe appeared quite energized by MTS, which they believed had transformed it from an educational and geographical outcast to one of the showcases of the district. The enrollment doubled in 1990-91 and is expected to increase by one-third in 1991-92. The message from the school leadership is clear. This is a technology school. MTS is only one source of funds for implementing technology. An IBM Networking Teachers project and, a math/science magnet are also important projects at Goethe. The Principal and Vice-Principal plus most of the faculty came to Goethe in

1988. Morale seemed high. Three strong teacher-leaders guide technology use here. Prior to their arrival, the laboratory (Information Center) was used as a showcase for the district. It is now used by the staff and students. Despite the relatively high degree of enthusiasm among the interviewed staff, it is interesting to note that only five out of 40 faculty members at Goethe returned the teacher surveys distributed in conjunction with this project. This was by far the lowest return rate among the 17 MTS Level I schools.

As reported in the template, the school has 60 computers, one file server, seven classes with six computers each plus the Information Center (15 computers and a large monitor). Ten networking teachers form the IBM project. One of the three resource teachers breathed credibility into the system by making the network usable (1989). The resource teachers report that teachers were trained after school, evenings, and on weekends. Twelve staff helped with the training. Now every class is on the network, including the administration. A key implementation strategy was to have the entire school use a single standard (Microsoft Word). All teachers are users in that each sends weekly progress reports home. No exodus from this school was reported due to the priority on and demands from technology use.

C. Burbank High School

Burbank has a history of technology implementation. The MTS project was added to an existing body of six computer labs, a technology program for orthopedically handicapped students, plus other individual systems. The Information Center opened in the Spring 1991 with an open house for the entire school. One-half day inservice (provided by the Technology Training Center) made teachers eligible for scheduling classes and previewing software in the Center. Already the schedule is full. The Site Coordinator is technically strong and respected by colleagues. His primary focus is to get the Information Center fully operational. However, this position terminates in June unless MTS continues to support the function, which was in doubt at the time of our site visit. The future of the Center is jeopardized with no resource person. The Principal is unable to commit other school funds.

The staff were provided the opportunity to provide input to the project when the proposal was written, but state that few opportunities for continuing input remain. About one-half the math teachers use technology, but the interviews revealed relatively little cooperation within this department. Teachers are encouraged to select and preview software. The science department is reported to be apathetic toward MTS.

Exhibit IX-8 summarizes the emphasis on various types of technology by site.

Exhibit IX-8

Types of Technology Use by Site			
	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Computers	+	+	+
Laserdisc/Interactive Video	-	-	+
Instructional Television (ITV)	-	-	-
Audio/Video Production	-	+	-
Satellite downlink for ITV reception/distance learning	-	-	
LCD Panels, Video Projectors	-	+	-
CD ROM	+	-	-
Technology for the handicapped		-	+
Science Lab Equipment		+	+
Calculators	-	+	+
Telecommunications	-	-	-
Music		-	-

+ = Major Emphasis - = Secondary Emphasis blank = No Emphasis

V. Support Resources

Personnel turnover seems to be a fact of life in this District. The Superintendent and Associate Superintendent at the onset of the project, both staunch technology supporters, are gone. District staff who participated in creating the vision of the MTS have little present involvement. Turnover in the administration and teaching staff of the MTS schools has been frequent. In the elementary school, the only original project teacher remaining serves as the Site Coordinator. The middle school is on its third principal during this project's tenure. All of the original MTS staff will be reassigned by the end of the fourth year.

Despite these changes, and the relatively slow start in getting the project underway at each of the three schools, project staff assert that MTS is a model for the district. District thinking about the merits of technology in the curriculum has led to the introduction of technology in other District schools. The Director estimates that representatives from approximately 25% of the other district schools have visited an

MTS site. The interviews revealed that the new superintendent's primary focus was the at-risk population and saw teacher attitudes toward these students as instrumental in improving their performance. While it is claimed that he now recognizes the potential offered by technology, he has stripped the project of its past leadership during the final year. The Project Director left the MTS at the end of the fourth year to direct the Grants Office, and hopefully, to increase business partnerships with the district. However, the move may benefit the district at the expense of the MTS. A new director with little prior technology experience and none with MTS will assume leadership of MTS in its fifth, and perhaps final year. The Curriculum Coordinator joins the Associate Superintendent for Curriculum and Instruction. All principals receive the project newsletter. Existence of MTS affected up-front planning for technology in other schools such as the nine magnet schools.

In general, the schools reported in the template that they receive the support required from the administration at the school and project levels. All schools reported that they would prefer additional support from parents and business partners.

VI. Funding Support

Each year, one school was designated as the "implementation" school, and therefore received the bulk of the support: year 1 (Kemble Elementary School); year 2 (Goethe Middle School); years 3 & 4 (Burbank High School). Non-implementation targets received support for substitutes (provided time for teachers to receive training and prepare curriculum units), software purchases, additional hardware and capital improvements (to fill gaps), and repairs on hardware already installed. Despite planned projections each year, changes often were necessitated by the availability of more advanced equipment, opportunities presented by business partners and unexpected circumstances.

Exhibit IX-9 summarizes AB1470 technology expenditures by school and for project-related district-level administrative and support activities for the 1989/90 school year. This is followed by Exhibit IX-10 which presents technology expenditures at the project schools and for project-level administration and support from all sources.

VII. Outcomes

Exhibits IX 11A-D, on the following pages, summarize the changes that occurred in each of the schools in student behavior, teacher instruction, administration and staff behavior, business partnerships and parent interaction.

The outcomes reported for **Kemble Elementary School** since implementing MTS can be summarized as follows:

Exhibit IX-9

AB1470 Technology Expenditures for 1989/90

	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High	District Administration	TOTAL
Certified Salaries	$10,810 (84.6%)	$3,966 (24.3%)	$2,274 (1.1%)	$110,637 (43.7%)	$127,687 (25.6%)
Classified Salaries	0	0	0	$66,426 (26.2%)	$66,426 (13.3%)
Employee Benefits	0	0	0	$38,066 (15%)	$38,066 (7.6%)
Books & Supplies	$1,514 (11.9%)	$5,623 (34.5%)	$2,275 (1.1%)	$3,053 (1.2%)	$12,465 (2.5%)
Services	$449 (3.5%)	$2,229 (13.7%)	$14,660 (6.6%)	$35,176 (13.9%)	$52,514 (10.5%)
Capital Outlay	0	$4,472 (27.5%)	$197,920 (91.2%)	0	$202,392 (40.5%)
TOTAL	$12,773 (100%)	$16,290 (100%)	$217,129 (100%)	$253,358 (100%)	$499,550 (100%)

Exhibit IX-10

Total Technology Expenditures at Project Schools by Source for 1989/90

	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High	District Administration	TOTAL
AB1470	$12,773 (19.5%)	$16,290 (5.7%)	$217,129 (73.2%)	$253,358 (78.4%)	$499,550 (51.4%)
District General Funds	$31,800 (48.6%)	$128,475 (44.8%)	$53,975 (18.2%)	0	$214,250 (22%)
District Categorical Funds	$13,350 (20.4%)	$131,943 (46%)	$25,612 (8.6%)	0	$170,905 (17.6%)
Donations - Estimated Value	$7,500 (11.5%)	$10,000 (3.5%)	0	$69,756 (21.6%)	$87,256 (9%)
TOTAL	$65,423 (100%)	$286,708 (100%)	$296,716 (100%)	$323,114 (100%)	$971,961 (100%)

The trend was in the right direction, toward more instructional interaction, emphasis on problem-solving, use of a variety of technologies, but with a decline in the fourth year. The largest reported and sustained improvement is in word processing and desktop publishing. Learning and working together among teachers has greatly improved. Parent interaction was strongest in the third year, although use of volunteers and increased parent contact through newsletters have increased. Business partnerships occurred more in the third years. The largest sustained improvement in student behaviors is their use of multimedia technology, use of non-class time for computers, and participation in extracurricular activities. No difference in standardized measures is reported. Administrative use of technology has expanded in record-keeping and through the use of an auto-dialer.

Several outstanding benefits were noted by the computer resource teacher: student attendance and motivation in writing/thinking; teacher's sense of empowerment, curriculum focus, collegial exchange, and professional growth; aides' professional growth and lost fear of technology; clerical staff's production of materials; maintaining attendance; record keeping; increased sense of professionalism; the principal's improved management; and technology as a catalyst for change in the school culture. Parents' respect for the school program was also reported to be on the rise.

Goethe Middle School joined MTS in the third year with a new staff. The template contains data only for that year, so no cross-year comparisons are presented. In instruction, the largest gains are shown in cooperative learning and student-based projects. Students seem to be investing in their own education by completing homework, using non-class time to gain access to computers, and using a variety of media. Some increases in writing and math scores are reported. Computers, laserdiscs, and camcorders are the technologies that have received greatest increased use. Technology use has increased throughout the curriculum except for drill and practice. Teacher interaction and morale has vastly improved. Parents have increased their attendance at school events. Interaction between the school and the home on instructional matters has also greatly improved. Goethe has little interaction with business partnerships. Technology use in school management and record keeping has greatly increased.

Outstanding benefits reported by the resource teachers include student increases in self-esteem, literacy, and job skills. Teacher increases in enthusiasm, computer proficiency, peers helping peers, creativity and involvement are also cited. Aides improved their skills and the clerical staff their efficiency. The principal improved communications with parents and improved control and access to student data. Improved staff relations overall, were reported.

Burbank High School reported data for the third and fourth years. Instructional gains were reported in cooperative learning and student-based projects and in the emphasis on problem-solving. Students were reported to be attending class more frequently, meeting higher standards of performance, and using non-class time to use computers. Primary increases in technology occurred with the computer and the calculator. A decrease in the use of technology for drill and practice and presentation of content occurred. The staff are talking more to one another, sharing resources, helping each other and feeling better about using technology. Parents also are reported as improving their interaction with the school, both by their presence at school events and discussions about student performance. Business partnerships have greatly increased. Computers are also used more for record keeping and grade maintenance.

Outstanding benefits to specified populations, as reported by the site coordinator, training director, and the principal include: improved school climate for students, increased use and understanding of technology in classroom, and more use of individualized instruction by aides.

Exhibit IX-11A
Student Behavior Outcomes

Student Behaviors	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Fewer class absences	** →	↗	↑
Completion of homework	** →	↗	↗
Participation in extracurricular activities	** ↗	↗	↗
Completion of extra tasks without being asked	** →	↗	↗
Higher standards of performance	** →	↗	↑
Use on non-class time for computers	**	↑	↑
Use of multi-media	** ↗	↑	↗

Student Performance Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

Exhibit IX-11B
Teacher Outcomes

Instructional Method	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Direct instruction/Lecturing	** ↘	↘	•
Teacher-student discussion	** –	↗	↗
Individual instruction	** –	–	↗
Cooperative learning	** –	↑	•
Student-based projects	** –	↑	↑
Instructional Emphasis			
Skill-based	** –	↘	↓
Content-based	** –	↗	↓
Affective domain	** –	–	not indicated
Cognitive emphasis	** –	↘	not indicated
Problem solving emphasis	** ↑	↗	↗
Technical Emphasis			
ITV	** –	↗	↗
Computer	** –	↑	•
Audio Tape	** –	–	–
Laser disc	** –	↑	↓
Calculator	** –	↗	↑
Camcorder	** –	↑	↗
Telecommunications	not indicated	–	↗
Technical Use			
Drill and practice	** ↘	↘	↓
Presentation of content	** ↗	↗	↓
Application to problem solving	** ↗	↗	↑
Word processing	** ↑	↑	↑
Desktop publishing	** ↑	↑	↑
Computer aided drafting	** –	↗	↑
Yearbook	not indicated	↑	↑
Student newspaper	not indicated	↑	↑

Student Performance Prior To Project:

Blank	= Not Present or Used
*	= Little Presence or Use
**	= Some Presence or Use
***	= Considerable Presence or Use

Direction of Change During Project:

Blank	= No Basis for Assessing
↓	= Large Decrease
↘	= Some Decrease
–	= No Difference
↗	= Some Increase
↑	= Large Increase

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Exhibit IX-11C
Administrative and Other Staff Outcomes

ADMINISTRATIVE USE	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Scheduling Classes	** →	↑	→
Recording Attendance	** ↗	↑	→
Maintaining Grades	** ↗	↑	→
Use of Auto Dialer	not indicated	↑	→
STAFF BEHAVIOR			
Sharing resources	** ↗	↑	↑
Initiating new activities	** ↗	↑	↑
Cross-talk about educational issues	** ↗	↑	↑
Volunteering personal time training, etc.	** ↑	↑	↗
Feeling of collegiality	** ↑	↑	↗
Improved morale	** ↗	↗	↗
Helping peers	** ↑	↑	↗
Learning together	** ↑	↑	↑
Seeking assistance/help	** ↑	↑	↗
Writing Grants	** ↗	↑	→

Use and Practices Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

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Exhibit IX-11D
Business Partnership and Parent Interaction Outcomes

BUSINESS PARTNERSHIPS	Edward Kemble Elementary	C.M. Goethe Middle	Luther Burbank High
Solicitation of businesses to collaborate with school	** ↗	→	↑
Appropriate fit between business/school agenda	** ↗	not indicated	↑
Number of business partners	↗	→	↑
Scope of business partnerships	→	→	↑
Active involvement in project planning	** →	↘	↑
Active involvement in project implementation	** →	↘	↑
PARENT INTERACTION			
Use of parent volunteers	** ↗	→	→
Attendance at PTA, etc.	** →	→	↗
Parent use of technology at home	** →	→	→
Amount of parent/school contact re: instructional matters	** →	↑	↗
Attendance at school events	** →	↑	↑

Partnerships and Interaction Prior To Project:

Blank = Not Present or Used
* = Little Presence or Use
** = Some Presence or Use
*** = Considerable Presence or Use

Direction of Change During Project:

Blank = No Basis for Assessing
↓ = Large Decrease
↘ = Some Decrease
→ = No Difference
↗ = Some Increase
↑ = Large Increase

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VIII. Recommendations/Comments

Classroom teachers, district administrators, and computer resource teachers offered recommendations and comments in the following areas:

- Training. Clarify expectations so teachers understand what they are being asked to join. Try to time the training with opportunities for application. Some teachers believed the gap between training and application was too long. All teachers wanted more release time from classroom assignments to become comfortable with equipment and materials, and to have more time to plan new curriculum units. A few teachers suggested that teachers should receive more useful technology training in postsecondary teacher preparation programs. One suggestion was to "market" technology as a change agent because of its capacity to transform teachers.

- Classroom configuration. Teachers prefer immediate access to the technology they use. Suggestions included a VCR and printer in each class, in addition to the computer. Some chose not to use the Information Center because of scheduling conflicts. Teachers who understood the rationale for a network-based system also experienced frustration when the system failed because all users were affected.

- District support. The State should specify the nature of the commitment required by districts to participate in a multi-year, multi-school demonstration projects. One requirement should be that they maintain staff stability at target schools. The departure of almost one-half of the teachers at the first MTS implementation school in Sacramento hampered project activities. Second, increase the capacity of other district departments critical to implementation. The maintenance department was insufficiently staffed to respond in a timely fashion to the installation needs of the MTS. Third, CDE should have a procedure for assessing the readiness of the targeted schools, (e.g., to install new equipment).

Recommended actions from the template included:

- mandatory site-based support in the State requirements

- increased personal contact (visits and phone calls) between the CDE and the project

- a clear research agenda (key questions, procedures and methodology, information needs) proposed by State

Chapter X
Summary and Conclusion

As the primary purpose of this volume is to provide a descriptive account of the MTS Level I Projects, relatively little emphasis has been placed on cross-site analyses, which will be reserved for the Phase III report. This chapter does, however, present some cross-site descriptive information. This information comes primarily from the self-assessment evaluation completed by each project. The last three exhibits in this chapter report the return rates on the teacher, visitor, and student surveys distributed for this evaluation. Tallies of responses to the items on these three instruments are included as Appendix B.

Exhibit X-1 provides a summary of demographic information for the schools included in each of the six MTS Level I projects. The first row shows that the number of schools included in the projects varies from one to four. Row two reflects the total enrollment of the MTS schools by project. It is shown that there is also a great deal of variation on this variable and that predictably there is a correspondence between this variable and the number of schools included in the project. This relationship is somewhat idiosyncratic, however, with the Los Angeles Unified project schools enrolling more than three times the Monterey project which also has four schools. With only one school in the project, the Hueneme Project has by far the smallest project enrollment of the six sites.

Exhibit X-1

MTS LEVEL 1 SCHOOLS

Demographic Characteristics of Project Schools by Project Site

	Alhambra	Cupertino	Los Angeles	Monterey	Pt. Hueneme	Sacramento
Number of Project Schools	2	3	4	4	1	3
Project School Enrollment	3,975	2,746	11,093	3,224	834	3,114
Percent Minority	89.3%	40.8%	98.5%	62.7%	86.4%	80.6%
Percent Chapter 1	33.1%	3%	55%	29.6%	39.5%	35.7%
Percent LEP	32.4%	4.9%	48.3%	29.3%	8.4%	23.3%
AB1470 Average $/Student/Year	$126	$182	$45	$155	$600	$161

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One of the priorities for site selection, as stated in the original Request for Proposals, released in conjunction with the Level I schools project, was the inclusion of schools with a relatively high percent minority enrollment. Counting all race/ethnicity groups other than Caucasian as minority, all six project sites show fairly high percentages of minority minority enrollment. Only the Cupertino/Fremont Project is under 50% minority enrollment; the Los Angeles Project reports the highest percent minority enrollment, 98.5%. Other demographic variables of interest are the percent enrollment eligible for Chapter 1 funds and the percent limited English proficient. The Los Angeles Project is highest on both of these dimensions and the Cupertino/Fremont Project the lowest.

The last row in Exhibit X-1 provides an indication of the potential intensity of project-related services across each of the six sites. The goal of each project is to involve as many of the students at each of the project schools as possible. As each project receives $500,000 per year, regardless of the number of schools or students included in the project, it is of interest to note the intensity of project resources per student across the six sites. The figures shown in this exhibit were derived by dividing the grant amount of $500,000 per year by the total enrollment of the schools included in each project. When comparing changes in outcomes across the six projects (e.g., changes in various types of assessment ratings), it is important to note that the level of change that would be expected from Los Angeles, at $45 per student per year, is quite different than from the Hueneme Project at $600 per year. It is also interesting to note that while these two projects fall at the extreme ranges on this variable, the other four projects form a fairly close band of variation from $126 per student at Alhambra to $182 in Cupertino. The variation in technology expenditures per student will become even more pronounced when we view full technology expenditures, as will be presented in Exhibit X-6.

Exhibit X-2 shows the total staff reported to be actively involved in the project at the time of completing the self-assessment inventory for this evaluation (Spring of 1991). "Active involvement" was defined, for the purpose of this question, as the number of staff who were actively implementing project administrative or instructional components during the Spring of 1991.

A large degree of variation in project involvement is also indicated across sites. For the school administrators at the project sites, only Cupertino indicates 100% involvement. Hueneme indicates one actively participating administrator for a rate of 25% involvement (i.e., one of four administrators at the project school were actively involved in the project).

While it is unclear why project site coordinators would be less than actively involved, Alhambra reports a rate of only 70%. The rate of participation for teachers ranges considerably across sites from an 84% rate of active involvement at Cupertino to 19% at Los Angeles. The degree of variation across all six sites is considerable. While some sites report policies of mandatory involvement for teachers, other sites purposely limit participation, and others actively encourage but do not mandate participation.

Exhibit X-2

Total Staff Reporting Active Project* Involvement by Project and Active Participants as a Percent of Total Staff						
	Alhambra	Cupertino	Los Angeles	Monterey	Pt. Hueneme	Sacramento
School Administrators	3 (43%)	6 (100%)	6 (50%)	7 (78%)	1 (25%)	5 (63%)
Site Coordinators	7 (70%)	3 (100%)	6 (66%)	3 (100%)	3 (100%)	3 (100%)
Teachers	85 (55%)	108 (84)%	119 (27%)	93 (51%)	8 (29%)	97 (66%)
Aides	17 (94%)	15 (56%)	62 (45%)	12 (26%)		12 (36%)
Clerical Staff	4 (17%)	14 (74%)	7 (100%)	6 (75%)	3 (100%)	10 (100%)
Parents	280	10	63			
Other		3 (38%)	1 (50%)	3 (43%)		1 (20%)

* Active involvement refers to staff who were actively implementing project administrative or instructional components during the Spring of 1991.

The degree of emphasis on involvement for instructional aides and clerical staff also varies considerably by site. Ninety-four percent of aides at the schools in the Alhambra project are active participants, as compared to only 26% for Monterey. The one school included in the Hueneme project shows no instructional aides. Enhancing technology in the administrative component of school operations is a much larger priority for some projects than for others, as indicated by the percent of clerical staff who are actively involved. While Los Angeles, Hueneme, and Sacramento all show 100% clerical staff involvement, Alhambra reports only 17% involvement.

Alhambra and Los Angeles report large numbers of parents as actively involved in the project, while Cupertino reports ten parents as being actively involved. The other three sites did not report any active parent participants.

Exhibit X-3 summarizes the total number of project-related training hours provided for the 1989/90 school year and for 1990/91 through March of 1991. Considerable variation is also reported for this important project-related component. While Hueneme and Alhambra report 5,500 and 4,225 training hours respectively; and Monterey and Cupertino report 2,873 and 1,550 hours; Sacramento and Los Angeles report only 270 and 155 hours of formal training during this period of time which spans nearly two project years. However, Los Angeles also reported substantial numbers of informal training hours.

Exhibit X-3

Project Related Training 1989/90 and 1990/91*

Projects:	**Alhambra**	**Cupertino**	**Los Angeles****	**Monterey**	**Pt. Hueneme**	**Sacramento**
Total Training Hours	4,225	1,559	155	2,873	5,500	270
Types of Participants						
Teachers	1,447	not avail.	448	226	42	788
Aides	117	not avail.	3	100	6	7
Administrators	14	not avail.	0	25	12	10
Clerical	10	not avail.	0	44	3	44
Parents	100	not avail.	0	330		2
Topics for Training						
Basic Orientation/ Introduction	++	+	++	+	++	++
Instructional Applications	++	++	++	++	++	++
Classroom Management	++	+	+	++	++	+
Office Administration	+	+	-	++	++	++

* Only includes training through March of 1991

** In addition to this formal training, Los Angeles reports significant amounts of informal training.

++ = Major Emphasis
+ = Secondary Emphasis
- = No Emphasis

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Project sites also report vast differences in the number of participants. While Alhambra reports providing training for 1,447 teachers, Hueneme reports only 42. Los Angeles has placed virtually all of its training emphasis on teachers, the other sites show a much broader range of participation in training by type of staff. For example, Los Angeles reports no training for administrative or clerical staff. Monterey and Alhambra report considerable participation in training activities by parents, while Sacramento reports two parent trainees. The other three sites report no parent involvement in training.

Exhibit X-3 also shows the breadth of the training provided by project. While instructional applications were reported as receiving major emphasis across all six projects, this was also the only area of major emphasis at Cupertino. Hueneme reports that all four of the areas listed in Exhibit X-3 received major emphasis during this training period. Only Los Angeles showed no emphasis on training in office management, because the district--not the project--provides hardware and software and trains staff in its use.

Four perspectives on dissemination activity by project are presented in Exhibit X-4: project services and products, activities for disseminating information, and total visitors by project year. Generally, there seems to be considerably less emphasis on the development and dissemination of project-related services than on products. Hence, while little variation is shown across service development and distribution, very substantial differences are found in the case of products. Hueneme, Cupertino and Alhambra appear to be well established as distributors of project-related products, while the other three sites appear to be well behind in this regard. However, although Los Angeles reports only one product as already disseminated or sold, they show the greatest number of products in progress or ready to disseminate.

The second block of data in Exhibit X-4 shows the number of activities in which the projects have engaged for the purpose of disseminating information. Because numbers within the project schools, within the district and out of the district are reported, it not only shows the magnitude of these types of efforts, but also their direction. While some projects tend to have a more internal focus when it comes to the distribution of products, others are more prone to focus their dissemination efforts beyond the confines of their own district. It would seem that both emphases are clearly appropriate for projects of this type. As they are funded by the state, there is a clear obligation to reach beyond local jurisdictions. On the other hand, if district leaders do not perceive Model Technology projects of sufficient value to disseminate within their own district, one could question their commitment to the advancement of educational technology and the extent to which these projects are prepared for dissemination activities statewide.

Exhibit X-4

Summary of Dissemination/Marketing Activities for the MTS Level 1 Projects

Total Developed Through Project:	**Alhambra**	**Cupertino**	**Los Angeles**	**Monterey**	**Pt. Hueneme**	**Sacramento**
Project Services:						
In Progress	2	0	2	0	0	0
Ready to Disseminate	0	0	0	0	2	1
Already Disseminated Sold/Donated	4	6	0	0	0	0
Project Products:						
In Progress	22	23	61	35	0	8
Ready to Disseminate	0	4	70	10	5	0
Already Disseminated Sold/Donated	*	53	1	7	775	7
Total Activities for Disseminating Information:						
In-School	459	262	103	110	44	17
In-District	135	77	20	63	40	30
Out-of-District	106	204	30	71	79	86
Total Visitors to the Project:						
Years 1 & 2	258	165	138	not counted	872	65
Year 3	463	466	225	189	941	150
Year 4	189	235	300	299	775	60
Total Visitors - All Years	910	866	663	488	2,588	275

* District reports that "many" items have already been disseminated.

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The majority of Alhambra's dissemination activities have been within project schools and they lead all the other projects on this dimension by a considerable margin. They have had 459 activities within two project schools as compared to Sacramento with 17 activities within three project schools. Alhambra has also been quite active in conducting within-district and out-of-district activities, leading the first of these two categories with 135 events and placing second in out-of-district functions with 106.

The Cupertino/Fremont Project reports the second-largest number of general dissemination activities. While the focus of these activities tends to be more directed within the MTS schools or to other districts, they also report the second largest number of dissemination functions to other schools within their own districts.

Monterey, Hueneme and Los Angeles are next in dissemination activities, reporting between approximately 150 to 250 dissemination activities. Sacramento reports the fewest number of dissemination activities. Of the activities in which they have been involved, Sacramento has focused on activities outside the district, while Monterey and Los Angeles have focused on dissemination activities within the district.

The last measure of dissemination activity shown in Exhibit X-4 is the number of visitors to the project through the implementation years. Clearly the most visible project in this regard is the Hueneme Project, with a total number of visitors that approaches three times that of the next most-visited project. The fact that the Hueneme district was up-and-running and well known for technology use even prior to their entry into the project is made evident by the very large number of visitors they had even in the first few years of implementation. This is especially compelling given the fact that they did not become a MTS site until the second year of overall project implementation.

The Alhambra and Cupertino Projects have also been extensively visited through the duration of the project. Los Angeles and Monterey also report high numbers of visitors, especially during the fourth year of implementation. The total at Monterey cannot be determined, as visitors were not counted at this project during the first and second years of implementation. Of the six projects, Sacramento reports considerably fewer numbers of visitors, and, as shown in Exhibit X-8, had a very low rate of return of visitor's surveys.

Exhibits X-5 and X-6 show total project (AB1470) and total technology expenditures at project schools by source and by project for the 1989/90 school year. These tables summarize the more detailed fiscal data presented in each of the chapters on the six projects. As each of the projects receives $500,000 in project (AB1470) funds each year from the state, the totals shown in Exhibit X-5 in excess of this amount for each project (except Sacramento) must reflect carry-over from a prior project year.

Exhibit X-5

AB1470 Technology Expenditures by Project for 1989/90

	Alhambra	Cupertino	Los Angeles	Monterey	Pt. Hueneme	Sacramento
Certified Salaries	$165,500 (32%)	$51,552 (8%)	$151,559 (30.3%)	$74,579 (9.9%)	$81,731 (6.8%)	$127,687 (25.6%)
Classified Salaries	$35,000 (6.8%)	$85,243 (13.7%)	$67,246* (13.4%)	$47,083 (6.3%)	$21,505 (1.8%)	$66,426 (13.3%)
Employee Benefits	$41,000 (7.7%)	$24,614 (4%)	$25,192 (5%)	$19,489 (2.6%)	$18,748 (1.5%)	$38,066 (7.6%)
Books & Supplies	$40,000 (7.7%)	$35,398 (6%)	$60,427 (12.2%)	$148,127 (19.7%)	$71,207 (5.9%)	$12,465 (2.5%)
Services	$94,425 (18.2%)	$119,050 (19.2%)	$110,600 (22.1%)	$194,110 (25.8%)	$161,417 (13.4%)	$52,514 (10.5%)
Capital Outlay	$141,775 (27.4%)	$304,339 (49.1%)	$84,976** (17%)	$267,930 (35.7%)	$852,728 (70.6%)	$202,392 (40.5%)
TOTAL	$517,700 (100%)	$620,197 (100%)	$500,000 (100%)	$751,318 (100%)	$1,207,336 (100%)	$499,550 (100%)

* Includes funds for training teachers paid out of a classified salary account.

** District reports that this does not include carryover which was later spent on capital outlay.

Other than the totals, the most informative aspect of Exhibit X-5 is the relative distributions of project funds across the expenditure categories: personnel, supplies and services, and capital expenditures. For example, while Alhambra, Los Angeles and Sacramento all spend close to, or more than, 40% of their grant awards on personnel, Cupertino spends a little over 20% in this area, while Monterey spends less that 20% and Hueneme less than 10%. Conversely, Hueneme spends the vast majority of their grant award on capital outlay, at 70.6% of the total. Sacramento and Cupertino spend more than 40% on capital items, while Los Angeles only spends 17%.

The major purpose of Exhibit X-6 is to illustrate the inter-relationship between the AB1470 grants and other technology-related activities and expenditures at each of the project sites. Technology is the major focus at some of the project sites, while at others the AB1470 technology grant is one among a number of competing priorities. The importance of this difference is that in comparing the overall technology-related infrastructure and products at each site, it is important to keep in mind that these results are not always sole products of the technology grant.

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Exhibit X-6

Total Technology Expenditures by Project by Source for 1989/90

	Alhambra	Cupertino	Los Angeles	Monterey	Pt. Hueneme	Sacramento
AB1470	$517,700 (83.5%)	$620,197 (58.5%)	$500,000 (52.4%)	$748,305 (83.2%)	$1,207,336 (53%)	$499,550 (51.4%)
District General Funds	$63,500 (10.3%)	$96,693 (9.1%)	$216,000 (22.6%)	$60,400 (6.7%)	$477,759 (19%)	$214,250 (22%)
District Categorical Estimated Value		$45,016 (4.3%)			$575,110 (25%)	$170,905 (17.6%)
Donations - Estimated Value	$38,612 (6.2%)	$293,269 (27.8%)	$238,495 (25%)	$90,952 (10.1%)	$58,000 (3%)	$87,256 (9%)
TOTAL	$619,812 (100%)	$1,055,174 (100%)	$954,495 (100%)	$899,657 (100%)	$2,318,205 (100%)	$971,961 (100%)
Total Schools Included in Project	2	3	4	4	1	3
Average Total Technology Expenditure/School	$309,906	$351,725	$238,624	$224,914	$2,318,205	$323,987

For example, technology was a major priority in the Hueneme District prior to the AB1470 grant. They substantially cut back on the number of instructional aides employed so that they could channel as many of their resources as possible toward technology expenditures. Of course, there is no reason why they should not place a local emphasis on technology that goes beyond project funds. To the contrary, such expansion is an expression of commitment to education technology, which benefits the state by leveraging project dollars to provide even better technology model schools throughout the state. On the other hand, in reviewing project-related products and in comparing results across projects, it is important to be aware of the varying extent to which they are the product of just the AB1470 grant as opposed to substantial additional commitments from other sources.

As described above, Exhibit X-6 shows a substantial commitment of funds for technology related expenditures at the one school in the Hueneme Project. However, besides the MTS dollars that were spent at Blackstock, the district committed general fund, lottery and SIP dollars of an equal amount to E.O. Green Junior High School in order to maintain equity within the two schools' programs. The Hueneme District has matched project-related expenditures of over a million dollars with an additional million in district general and categorical funds. Along with donations, these expenditures add up to over two million dollars on technology related expenditures at one school for the 1989/90 school year.

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In contrast, the Alhambra Project reports spending relatively little beyond the grant amount for this year. Three of the districts show local, general fund contributions of more than $100,000 for this year while the other three received less than this amount from the general fund. Three of the districts directed categorical funding toward technology-related expenditures at the project schools, while the other three did not use these sources of funding for technology related purposes. Both Hueneme and Sacramento made fairly extensive use of categorical funds (e.g., Chapter 1, SIP, state compensatory education, etc.).

While all of the projects reported technology related contributions at the project schools for this school year, Cupertino and Los Angeles report substantially more contributed resources than the other project sites. In both instances contributions comprise 25% or more of all technology related expenditures at the project schools for the 1989/90 year.

The average expenditure per Model Technology School per project is shown in the last two rows of Table X-6. This clearly illustrates the extent to which the Hueneme Project is different from the others in this regard. While all of the other Model Technology Schools in the project spent between approximately 225 and 350 thousand dollars on technology during 1989-90, over two million dollars were spent at Blackstock School in the Hueneme Project.

Exhibits X-7 through X-9 report information about the numbers and types of respondents to the three surveys distributed in conjunction with this evaluation. The first, Exhibit X-7, shows rates of returns for the teacher survey at each of the project schools and for the project overall.

After the 100% rate of return for the 28 teachers in the Hueneme Project, the next highest overall rates of return were found in the Cupertino and Monterey Projects. Nearly 88% of Cupertino's surveys were returned, while the Monterey Project managed a return rate of nearly 75%. The overall rates of return for the Alhambra and Sacramento Projects were all well under 50%.

Exhibit X-7

Teacher Survey: Total Teachers, Total Returns and Percent Returns By School by Project					
ALHAMBRA	Emery Park Elementary	Alhambra High			TOTAL
Teachers	15	140			155
Returns	15	53			68
Ret %:	100.00%	37.86%			43.87%
CUPERTINO	Garden Gate Elementary	Kennedy Jr. High	Monta Vista High		TOTAL
Teachers	19	37	73		129
Returns	18	31	64		113
Ret %:	94.74%	83.78%	87.62%		87.57%
LOS ANGELES	Corona Elementary	Loma Vista Elementary	Nimitz Jr. High	Bell High	TOTAL
Teachers	52	42	100	103	297
Returns	20	23	97	34	174
Ret %:	38.46%	54.76%	97%	33%	59%
MONTEREY	Ord Terrace Elementary	Manzanita Elementary	Martin Luther King Middle	Monterey High	TOTAL
Teachers	40	19	36	88	183
Returns	34	15	35	52	136
Ret %:	85.00%	78.88%	97.25%	59.09%	74.31%
PT. HUENEME	Blackstone Middle				TOTAL
Teachers	28				28
Returns	28				28
Ret %:	100.00%				100.00%
SACRAMENTO	Edward Kemble Elem.	C.M. Goethe Middle	Luther Burbank H.S.		TOTAL
Teachers	33	40	75		148
Returns	10	5	34		49
Ret %:	30.30%	12.50%	45.33%		33.11%

Variation in the rates of return across the project sites is considerable. While too much should not be read into these differing levels of response, one might argue that to a limited extent they serve as a proxy measure of overall project visibility, enthusiasm and support. With this idea in mind, it is not surprising that the rates of return are generally quite a bit higher for elementary and middle schools than for high schools, where there are likely to be more competing interests and a smaller percent of faculty directly involved in the project. There are exceptions to this, however, with Monta Vista School in Cupertino showing nearly an 88% rate of return, while Corona Avenue Elementary, in Los Angeles, showed a return of only about 38%.

All of the projects were also requested to ask all of their visitors between the months of January and May, 1991 to complete visitor evaluation surveys. While Monterey and Hueneme returned over 100 visitor surveys, and Alhambra and Cupertino returned 77 and 40, respectively, the Sacramento project returned only two surveys and Los Angeles only one.

Exhibit X-8

Number of MTS Level I Visitor Surveys
and Percent of Visitor Surveys by Site
(January through May, 1991)

Site	Total Visitor Surveys	Percent of Visitor Surveys
ALHAMBRA	77	21.6%
CUPERTINO	49	13.7%
LOS ANGELES	1	0.3%
MONTEREY	102	28.6%
PT. HUENEME	126	35.3%
SACRAMENTO	2	0.6%
TOTAL	357	100%

The last exhibit in this chapter, Exhibit X-9, summarizes the student survey responses by type of survey (i.e., elementary versus secondary and English versus Spanish versions) by project. Elementary surveys were designed for use in grades three through six and the secondary surveys for grades seven through twelve. All students were given the option of completing English or Spanish language versions of the survey instrument. The student surveys were administered to a sample of six classes at each school. Three of these classes were to be from teachers, who were relatively high technology users and who had been in the project for a few years, and the other three were to be from low technology teachers who were not in the project or who were new project entrants. As the surveys were administered to six classes at all of the project schools, variations in total return are

Exhibit X-9

Summary of Student Survey Responses										
	Elementary Surveys					Secondary Surveys				
Project	From High Technology Class	From Low Technology Class	English Survey	Spanish Survey	TOTAL	From High Technology Class	From Low Technology Class	English Survey	Spanish Survey	TOTAL
Alhambra	74 (47.4%)	82 (52.6%)	125 (80.1%)	31 (19.9%)	156 100%	86 (57.7%)	63 (42.3%)	149 (100%)		149 100%
Cupertino	82 (50.3%)	81 (49.7%)	163 (100%)		163 100%	150 (45.7%)	178 (54.3%)	328 (100%)		328 100%
Los Angeles	146 (50%)	146 (50%)	199 (68.2%)	93 (31.9%)	292 100%	49 (43.8%)	63 (56.3%)	112 (100%)		112 100%
Monterey	187 (67.8%)	89 (32.3%)	273 (98.9%)	3 (1.1%)	276 100%	167 (69%)	75 (31%)	241 (99.6%)	1 (.4%)	242 100%
Pt. Hueneme	27 (100%)		23 (85.2%)	4 (14.9%)	27 100%	52 (31.7%)	112 (68.3%)	138 (84.2%)	26 (15.9%)	164 100%
Sacramento	73 (50%)	73 (50%)	132 (90.4%)	14 (9.6%)	146 100%	154 (56.2%)	120 (43.8%)	268 (97.8%)	6 (2.2%)	274 100%

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more reflective of average class size at these schools and the number of schools in the project. The preliminary results from all three of these surveys are contained in Appendix B. Analysis of these results will be conducted in the next phase of this evaluation and will be issued in a separate analysis report.

APPENDICES

Appendix A: The Model Technology School Level I Evaluation Data Collection Instruments

Appendix B: Survey Results

Appendix C: Interview Protocols

APPENDIX A:

THE MODEL TECHNOLOGY SCHOOL LEVEL I EVALUATION DATA COLLECTION INSTRUMENTS

- The Self-Assessment Inventory
- The Teacher Survey
- The Visitor Survey
- The Elementary Student Survey
  (English and Spanish Versions)
- The Secondary Student Survey
  (English and Spanish Versions)

The Self-Assessment Inventory

District-based Form

CETAP EVALUATION
MODEL TECHNOLOGY SCHOOLS - LEVEL I

SECTION I: BACKGROUND INFORMATION

A. District Demographics

1. District:______________________________

Address:______________________________

City:____________________ ZIP:__________

2. District contact person:____________________ Title:____________ Ph:____________

3. Person with primary responsibility for completing this form:____________

Title: ________________

Ph: ____________ Date: ____/____/____

4. District enrollment (1990/91):..#________

5. Total number of schools served by project:........................#________

6. Ethnic distribution of students: (1990/91)

Asian	____ %	Hispanic	____ %
Black	____ %	Native American	____ %
Caucasian	____ %	Other: (Specify)______________..	____ %

7. Number of students in the district who are: (1990/91)

Eligible for Chapter 1 services ....__________

Limited English proficient ....__________

Name and title of person completing this page: 167______________________

B. School Demographics (complete for every project school)

1. School: ______________________

Address: ______________________

City: ______________ ZIP: ________

District: ______________________

2. School contact person: ______________ Title: __________ Ph: __________

3. School enrollment (1990/91): .... #________

4. Total number of teachers: .... #________

5. School location (circle one):

Rural 1
Suburban 2
Urban 3

6. School level (circle one):

Elementary 1
Middle/Junior High 2
High 3

7. Ethnic distribution of students: (1990/91)

Asian .... ____ %
Black .... ____ %
Caucasian .... ____ %

Hispanic .... ____ %
Native American .... ____ %
Other: (Specify) ______________ .. ____ %

8. Which grades in the study are served by the project ? (circle): K 1 2 3 4 5 6 7 8 9 10 11 12

Other: ______________________

9. Number of students in this school who are: (1990/91)

Eligible for Chapter 1 services .... ________
Limited English proficient .... ________

Name and title of person completing this form: ______________________

10. **Project Participation.** Indicate the number of current staff and their level of involvement in the project at this school.

Indirect Involvement: Staff who are participating in the project at some level, but who are not yet actively implementing project administrative or instructional components at this time.

Active Involvement: Staff who are actively implementing project administrative or instructional components at this time.

	Total Number At School	Active Involvement	Indirect Involvement	No Involvement
School Administrators				
Site Coordinators				
Teachers				
Aides				
Clerical Staff				
Parents	N.A.			
Other				

11. Briefly describe the prior degree of technology use in this school prior to the initiation of the MTS project.

Name and title of person completing this page: ______________________________

SECTION II: Planning

A. Project-wide Planning

1. Indicate areas of change over the span of your project from what was originally proposed. Fill in the appropriate codes below. For example, "0-1" indicates the beginning of the project to the end of year one.

Codes:	1 = Large Decrease	4 = Some Increase
	2 = Some Decrease	5 = Large Increase
	3 = No Difference	NA = Not Applicable

	Years of the Project				
Categories of Change:	0-1	1-2	2-3	3-4	4-5 (Anticipated)
Dissemination of products	___	___	___	___	___
Dissemination of promising practices	___	___	___	___	___
Business Partnerships	___	___	___	___	___
Centralized/Decentralized Proj. Planning	___	___	___	___	___

2. Briefly describe the process for designing your annual MTS plan. List the people involved and their relationship to the project.

Name and title of person completing this page: ______________________________

3. *California Education Summit.* Indicate the degree to which your MTS project addressed the *California Education Summit* topics. (Although we recognize that these relationships were not required in the original RFP, we are asking this question because of the current relevancy of these topics to CDE interests.)

	(Circle One) **No Emphasis ⟷**			**High Emphasis**
Increasing accountability and improving assessment	1	2	3	4
Enhancing the curriculum	1	2	3	4
Improving high school transitions	1	2	3	4
Improving adult literacy	1	2	3	4
Organizing effective services for children, youth, families at risk	1	2	3	4
Restructuring to improve student performance	1	2	3	4
Improving teacher preparation and recruitment	1	2	3	4

Comments:

Name and title of person completing this page: ______________________________

B. Planning At Each Project School ____________________
(Name of School)

1. Have you ever had a school site technology planing committee? Yes _____ No _____
(If No, skip to question # 6)

2. Identify the function(s) of this planning committee in project activities over the span of the project (circle all numbers that apply):

	YR 1	YR 2	YR 3	YR 4
Original proposal development	1	1	1	1
Design of annual site plan	2	2	2	2
Advising on project changes	3	3	3	3
Advocating for the project	4	4	4	4
Monitoring the project	5	5	5	5
Evaluating the project	6	6	6	6
Other (describe):	7	7	7	7

3. Indicate how often this committee currently meets (circle one):

Weekly 1
Bi-weekly 2
Monthly 3
Bi-monthly 4
Other (specify)____________________ 5

4. Indicate the statement below that best describes the technology use plan (TUP) in your school (circle one):

Technology use is written into existing School Improvement Plan.................................1
Technology use is written into existing Chapter I Plan.................................2
Technology use is written into the ____________________(specify) Plan. 3
A separate TUP wa developed 4

5. To what extent does the school TUP correspond to the district TUP? (circle one):

A district TUP does not exist.................................1
The school plan incorporates some district planning elements. 2
The school plan closely supports the district plan.................................3
The school plan did not support the district plan.................................4

6. Indicate the actual number of participants involved in planning and implementing the project in each of the following categories:

	Beginning	Current
District administrators	# _____	# _____
Project staff	# _____	# _____
School administrator(s)	# _____	# _____
Site coordinator	# _____	# _____
Teachers	# _____	# _____
Students	# _____	# _____
Parents	# _____	# _____
Other:____________________	# _____	# _____

7. Describe any other technology-related planning activities at this site.

Name and title of person completing this page:____________________

9. **Site Level Change.** Indicate areas of change over the span of project at your school from what was originally proposed in the chart below:

Codes:
1 = Large Decrease
2 = Some Decrease
3 = No Difference
4 = Some Increase
5 = Large Increase

					(Anticipated)	
Categories of Change:	Project Years: 0	1	2	3	4	5
Integrating Technology Into Curriculum		___	___	___	___	___
Parent Involvement		___	___	___	___	___
Business Partnerships		___	___	___	___	___
Centralized to Decentralized Site Planning		___	___	___	___	___

Name and title of person completing this page: ______________________________

SECTION III: Content

A. Project-Wide Staff Development/Training

1. Describe any special characteristics of the training that have been particularly successful.

2. Count the total number of hours of project-related training and the number of trainees during the school years, 1989/90 and 1990/91 (through March). For example, if you offered two training sessions of three and five hours each, the total number of training hours would be eight. Under the "number of participants" count all staff attending any project-related training during this time period.

Total Training Hours	Number of Participants:				
	Teachers	Aides	Administrators	Clerical	Parents

3. To what extent did the training activities address each of the following general technology topics (Circle **M** if major emphasis, **S** if secondary emphasis, or **N** if no emphasis):

Basic Orientation/Introduction..................	M	S	N
Instructional Applications..........................	M	S	N
Classroom Management.............................	M	S	N
Office Administration................................	M	S	N

Name and title of person completing this page: ______________________________

4. Approximately what percent of the training listed above was provided by the following?

Project Staff	______ %	Other District Staff	______ %
Business Partner	______ %	Consultant	______ %
		Other	______ %

B. Learning Resources Management

1. In what ways has the project improved the management of learning resources?

2. What procedures are in place for reviewing technology-based learning resources prior to purchase?

Name and title of person completing this page: ______________________________

C. Dissemination/Marketing

1. How many of the following types of products or services have been developed by your project that may be useful, or have already been disseminated, to school districts throughout the state?

PRODUCTS:	In Progress	Ready to Disseminate	Already Disseminated Sold Donated	Intended Users				
				Teachers		Management		Trainers
				Elem.	Sec.	Sch.	Dist.	
Implementation Manuals								
Curriculum Manuals								
Evaluation Materials								
Videos								
Curriculum Units								
Staff Development Package								
Brochures/Info. Packets								
Other Products								
SERVICES:								
Technology Use or Planning								
Tech./Curricular Integration								
Use of Equipment/Software								
Software Selection								
Evaluation Technology								
Other Services								

Name and title of person completing this page: ______________________________

2. Since the project began, approximately how many times have you used each of the following methods to inform others about the project?

	In-School	In-District	Out-of-District
Staff Meetings			
Conference Presentations			
Training Workshops			
Journal Articles			
Other Articles			
Advertising			
Television Exposure			
Site Visits			

3. Since the project began, approximately how many times have you used other dissemination strategies to inform others of these products?

Publishing articles ____________
Collaborating with the business partner ____________
Advertising/Promotional Fliers ____________
Using the California Technology Project ____________
Other ____________

4. What do you think has been your most effective dissemination approach and on what evidence do you base this assessment?

5. How many visitors have you had over the life of the project? (Estimate or use exact counts where available.)

Year 1	Year 2	Year 3	Year 4
_____	_____	_____	_____

(Use the code '-99' for each year in which the number of visitors was not counted.)

Name and title of person completing this page: ______________________________

6. Do you assess the usefulness of these visits? Yes ____ No ____

If yes, check the procedures used: (Check All That Apply)

Verbal feedback ______
Checklist ______
Interview ______
Visitor Survey ______
Follow-up Phone Call ______

D. Evaluation

1. How was the research partner for your MTS project selected?

2. In what ways and to what extent have the research partners been involved in ongoing project planning and management?

3. What technology related research efforts will be continued by the district when MTS funding ends?

4. What specific research instruments or components from the research team will you continue to use?

Name and title of person completing this page: ______________________________

The remaining questions in this section should be completed by your research team.

5. What are the objectives and expected outcomes from this research effort?

6. Specifically list some of most important research findings to date and tell how these findings have affected the project's design, management, or direction.

Year 1:

Year 2:

Year 3:

Year 4:

6. Describe changes in the basic research questions since the beginning of the project.

Year 1:

Year 2:

Year 3:

Year 4:

Name and title of person completing this page: ______________________________

7. Describe your evaluation plan for assessing dissemination and adoption/adaption of project practices and products.

8. Describe any procedures you have developed to evaluate products and services prior to dissemination.

9. What recommendations would you make to the state regarding the structure and composition of the research component of future projects of this type?

10. Rate the degree to which you were given independence in conducting your research and in reporting findings. (Circle One)

Completely Independent	Very Independent	Somewhat Independent	Limited Independence
1	2	3	4

11. Describe the extent to which your evaluation has had a formative and summative orientation.

	Strong	Moderate	Weak
Formative	1	2	3

Explain:

	Strong	Moderate	Weak
Summative	1	2	3

Explain:

Name and title of person completing this page: ______________________________

12. Indicate the instruments, data sources, and procedures used in your evaluation and rate the relative importance of each to your overall research effort.

(Circle One)

	Relative Importance to Research Effort					
Instruments:	Very Important	1	2	3	4	Not Used
Student Surveys		1	2	3	4	
Teacher Surveys		1	2	3	4	
Parent Surveys		1	2	3	4	
Other Data Sources:						
Student Grades		1	2	3	4	
Portfolio Assessment		1	2	3	4	
Writing Samples		1	2	3	4	
Proficiency Tests		1	2	3	4	
Standardized Tests		1	2	3	4	
Student Attendance		1	2	3	4	
Time Logs of Technology Use		1	2	3	4	
SIP or Other Instructional Plans		1	2	3	4	
Project Product Assessment		1	2	3	4	
Workshop Evaluations		1	2	3	4	
Business Partner Contributions		1	2	3	4	
Student Affective Measures		1	2	3	4	
Test Records		1	2	3	4	
Procedures:						
Case Studies		1	2	3	4	
Classroom Observations		1	2	3	4	
Teacher Interviews		1	2	3	4	
Student Interviews		1	2	3	4	
Parent Interviews		1	2	3	4	
Business Partner Interviews		1	2	3	4	
Assessment of Curriculum Alignment		1	2	3	4	
Needs Assessment		1	2	3	4	
Other: ______________________		1	2	3	4	

Name and title of person completing this page: ______________________

SECTION IV: Project Implementation

(Complete for every project school - school name ________________________________)

1. Indicate the major areas emphasized by the project (circle M if major emphasis, S if secondary emphasis, or N if no emphasis):

Curriculum Areas

a. English/Language Arts	M	S	N
b. History-Social Science	M	S	N
c. Mathematics	M	S	N
d. Science	M	S	N
e. Foreign Languages	M	S	N
f. Visual and Performing Arts	M	S	N
g. Health Education	M	S	N
h. Physical Education	M	S	N
i. Vocational Education	M	S	N
j. Other: ____________________	M	S	N

School-Wide Areas

a. General technology use	M	S	N
b. Technology in the curriculum	M	S	N
c. School restructuring	M	S	N
d. Professional development	M	S	N
e. School climate improvement	M	S	N
f. Other: ____________________	M	S	N

Process Areas

a. Critical thinking	M	S	N
b. Cooperative learning	M	S	N
c. Study Skills	M	S	N
d. Self-esteem	M	S	N
e. Interest/attitude	M	S	N
f. Other: ____________________	M	S	N

2. Indicate the type(s) of technology used at this site (circle M if major emphasis, S if secondary emphasis, or N if no emphasis):

a. Computers	M	S	N
b. Laserdisc/Interactive Video	M	S	N
c. Instructional Television (ITV)	M	S	N
d. Audio/video production (Video cameras, camcorders, editing equipment)	M	S	N
e. Satellite downlink for ITV reception/distance learning	M	S	N
f. LCD Panels, Video Projectors	M	S	N
g. CD ROM	M	S	N
h. Technology for the handicapped	M	S	N
i. Science Lab Equipment (probes, microscopes, weather instruments, etc.)	M	S	N
j. Calculators	M	S	N
k. Telecommunications (telephone, modem, FAX)	M	S	N
l. Music (keyboards, MIDI interfaces, sound digitizers, audio equipment, etc.)	M	S	N
m. Other: (describe)____	M	S	N

3. Indicate the software type(s) used at this site (circle M if major emphasis, S if secondary emphasis, or N if no emphasis).

a. Word processing/desktop publishing	M	S	N
b. Integrated Learning Systems (ILS)	M	S	N
c. Computer Assisted Instruction (CAI) System	M	S	N
d. Hypermedia/multimedia	M	S	N
e. Graphics programs	M	S	N
f. Electronic encyclopedia, reference	M	S	N
g. Database, spreadsheet, other business software	M	S	N
h. Music, voice, speech recognition	M	S	N
i. Programming (Basic, Pascal, C, LOGO, etc.)	M	S	N
j. School management	M	S	N
k. Other instructional software (Not CAI or ILS)	M	S	N
l. Telecommunications software	M	S	N
m. Other: (describe)______________________	M	S	N

Name and title of person completing this page:______________________________

4. How many computers are in your school, including those purchased by the project?

In computer laboratories ________
In classrooms ________
Checked out to teachers ________
In the teacher workroom ________
Checked out to students ________
In the library ________
Checked out to parents ________
In administrative offices ________
Other ____ ________

5. How many VCRs are located:
In Classrooms ________
On Carts ________
Other ________

6. How many laser disk players are at this school site?

In the Library ________
In Individual Classrooms ________
In Other Rooms ________

7. If there are other major technology items used in the school not listed above, what are they, how many are there, and where are they located?

8. Briefly describe how your school involved parents in each of the following project-related activities?

Class Instruction:

Tutoring:

Other Family Contact:

Name and title of person completing this page: ________________________________

9. Approximately what percent of the classrooms in your school have at least one computer? ______ %

10. Considering all of the technology items in your school, approximately what percentage were purchased with project funds?

______ %

Name and title of person completing this page: ______________________________

SECTION V: Support Resources

School Name: ______________________________
(Please complete this question for each project school.)

1. Rate the extent to which your project currently receives support from each of these sources and the extent to which you believe support is needed for successful implementation.

Sources of Support	**Support Needed** (Circle One) Low 1 2 3 4 High	**Actual Support** (Circle One) Low 1 2 3 4 High
School Administration	1 2 3 4	1 2 3 4
Project Administration	1 2 3 4	1 2 3 4
District Administration	1 2 3 4	1 2 3 4
California Department of Education	1 2 3 4	1 2 3 4
Parents	1 2 3 4	1 2 3 4
Business Partners	1 2 3 4	1 2 3 4
California Tech. Project	1 2 3 4	1 2 3 4
Other ________________ (Specify)	1 2 3 4	1 2 3 4

2. Where there have been substantial shifts across any of these sources of support through the duration of the project, describe below:

School Administration

Project Administration

District Administration

California Department of Education

Parents

Business Partners

California Tech. Project

Other ________________

Name and title of person completing this page: ______________________________

3. Where a substantial discrepancy is reported for any of the items in question #1 above. e.g. a "3" or "4" under "support needed" and a "1" or "2" on "actual support," describe what will be needed from these sources to ensure the successful continuation of your project.

School Administration

Project Administration

District Administration

California Department of Education

Parents

Business Partners

California Tech. Project

Other ____________________
(Specify)

Name and title of person completing this page: ______________________________

SECTION VI: Funding Support

The first two questions in this section pertain to the worksheets that follow on pages 22 and 23. The first worksheet requests total technology-related expenditures for 1989-90 by school. This worksheet should be completed for every school in your project. Note, however, that the technology-related expenditures to be reported on this form should not just be limited to project funds, but should reflect expenditures from all sources for 1989-90. On the second worksheet, on page 23, report project-wide expenditures across all sources. Project-wide expenditures would include the time of the project director and other administration and support staff, who are used project wide. Expenditures reported on the school form should not be reported again on the project-wide form.

1. **Technology Expenditures for 1989-90 by School** List all technology related expenditures specific to each project school. Estimate a dollar value for all donated resources and services. For faculty and staff, only count time that is allocated to technology on a supplemental basis, i.e. additional faculty and staff time that has been employed specifically to implement and maintain technology use.

2. **Project Related District-Wide Technology Expenditures for 1989-90** List all project-wide AB 1470 expenditures or project-wide expenditures from other sources. Do not repeat any of the school-based expenditures shown for question #1, above.

3. Briefly describe the basis on which you have distributed project funds across the project school sites? How was it determined how much project funding each site would receive?

Name and title of person completing this page: ______________________________

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1. 1989-90 Expenditures By School. Enter separately the amount of the AB 1470 funding, district funding, both general and catagorical, and donations expended for each of the budget categories indicated:

SCHOOL NAME: ______________________________ (complete for each school)

School-based Form

Technology Expenditures for 1989-90 By School

(Round to the Nearest $)

ACCOUNT NUMBERAND CLASSIFICATION		Catagories of Funding				TOTALS BY CATEGORY
		AB 1470 FUNDS	DISTRICT-GENERAL FUNDS	DISTRICT-CATEGORICAL FUNDS	ESTIMATED VALUE OF DONATIONS	
1000 Certified Salaries FTE ________	Staff					
	Other					
2000 Certified Salaries FTE ________	Staff					
	Other					
3000 Employee Benefits	Staff					
	Other					
4000 Books and Supplies						
5000 Services and Other Operating Expenditures						
6000 Capital Outlay						
TOTAL TECHNOLOGY EXPEDITURES 1989/90						

Name and title of person completing this page: ______________

2. **Project–Wide 1989-90 Expenditures.** Enter separately the amount of the AB 1470 funding, district funding, both general and catagorical, and donations expended for each of the budget categories indicated:

Project–WideTechnology Expenditures for 1989-90

(Round to the Nearest $)

ACCOUNT NUMBERAND CLASSIFICATION		Catagories of Funding				TOTALS BY CATEGORY
		AB 1470 FUNDS	DISTRICT-GENERAL FUNDS	DISTRICT-CATEGORICAL FUNDS	ESTIMATED VALUE OF DONATIONS	
1000 Certified Salaries FTE ____________	Staff					
	Other					
2000 Certified Salaries FTE ____________	Staff					
	Other					
3000 Employee Benefits	Staff					
	Other					
4000 Books and Supplies						
5000 Services and Other Operating Expenditures						
6000 Capital Outlay						
TOTAL TECHNOLOGY EXPEDITURES 1989/90						

Name and title of person completing this page: ____________________________

SECTION VII: Outcomes

School Name:____________________

(Please complete this section for each project school)

The purpose of this section is to measure change over time attributed to the MTS projects. What differences has the MTS made in the district and in the schools that otherwise would not have occurred? First indicate the degree to which each of the categories listed below were present in your school in the box labelled "Before MTS." Use the following codes:

A = not present or used; B = little presence or use;
C = some presence or use; D = considerable presence or use;

Indicate the level of change you believe the MTS project has made **in your school** in each of the following categories. Respond for EACH YEAR. If a category does not apply to your project, place NA in the appropriate space.

Use the following codes to respond to question 7.1 through 7.6:

1 = large decrease; 2 = some decrease; 3 = no difference;
4 = some increase; 5 = large increase.

1.

Instructional Method	**Before MTS**	**Yr1**	**Yr2**	**Yr3**	**Yr4**
• Direct instruction/Lecturing					
• Teacher-student discussion					
• Individual instruction					
• Cooperative learning					
• Student-based projects					
• Other					

Instructional Emphasis					
• Skill-based					
• Content-based					
• Affective Domain					
• Cognitive Emphasis					
• Problem solving emphasis					
• Other					

Name and title of person completing this page:__________________________

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1.

Instructional Method (Continued)	**Before MTS**	**Yr1**	**Yr2**	**Yr3**	**Yr4**
Technical Emphasis					
• ITV					
• Computer					
• Audio tape					
• Laser disc					
• Calculator					
• Camcorder					
• Telecommunications					
• Other					

Technical Use					
• Drill and practice					
• Presentation of content					
• Application to problem solving					
• Word processing					
• Desktop publishing					
• Computer aided drafting					
• Yearbook					
• Student newspaper					
• Other					

Comments:

Name and title of person completing this page:____________________________

2.

Staff Behavior	**Before MTS**	**Yr1**	**Yr2**	**Yr3**	**Yr4**
• Sharing resources					
• Initiating new activities					
• Cross-talk about educ. issues					
• Volunteering personal time training, etc.					
• Feeling of collegiality					
• Improved morale					
• Helping peers					
• Learning together					
• Seeking assistance/help					
• Writing grants					
• Other					

Briefly describe the nature of these changes and cite evidence where available.

3.

Parent Interaction	Before MTS	Yr1	Yr2	Yr3	Yr4
• Use of parent volunteers					
• Attendance at PTA, etc.					
• Parent use of technology at home					
• Amount of parent/school contact re instructional matters					
• Attendance at school events					
• Other					

Briefly describe the nature of these changes and cite evidence where available.

Name and title of person completing this page:______________________________

4.

Business Partnerships	Before MTS	Yr1	Yr2	Yr3	Yr4
• Solicitation of businesses to collaborate with school					
• Appropriate fit between business/school agenda					
• Number of business partners					
• Scope of business partnerships					
• Active involvement in project planning					
• Active involvement in project implementation					

Briefly describe the nature of these changes and cite evidence where available.

5.

Student Behaviors	Before MTS	Yr1	Yr2	Yr3	Yr4
• Fewer class absences					
• Completion of homework					
• Participation in extracurricular activities					
• Completion of extra tasks without being asked					
• Higher standards of performance					
• Use of non-class time for computers					
• Use of multi-media					

Briefly describe the nature of these changes and cite evidence where available.

Name and title of person completing this page: ______________________

6.

Administrative Use	**Before MTS**	**Yr1**	**Yr2**	**Yr3**	**Yr4**
• Scheduling Classes					
• Recording Attendance					
• Maintaining Grades					
• Use of Auto-dialer					
• Other ____________________					

Briefly describe the nature of these changes and cite evidence where available.

7.

Standardized Measures of Student Performance	**Before MTS**	**Yr1**	**Yr2**	**Yr3**	**Yr4**
• CAP scores (writing)					
• CAP scores (math)					
• Standardized test scores scores, e.g. CTBS, Iowa, etc.					
• Other					

Provide any further clarification that may be available.

Name and title of person completing this page:______________________________

8. Briefly describe any UNIQUE OR OUTSTANDING benefits to each of the following populations that you believe can be attributed to MTS.

- Students

- Teachers

- Aides

- Clerical staff

- Principals

- District Administrators

- Site Administrators

- Project Directors

- Business Partners

- Parents

- Other

Name and title of person completing this page:______________________________

SECTION VIII: Recommendations

We are interested in your ideas and suggestions about ways to improve the MTS projects. Please comment about each of the following areas.

- State MTS Requirements

- Local MTS Governance Structure

- Staff Development

- Alignment with State Curriculum Frameworks

- Level of Technical Support from CDE

- Level of Fiscal Support from All Sources

- Cooperation with Other MTS Projects

- Dissemination Activities

- Other

Name and title of person completing this page:______________________________

The Teacher Survey

CETAP EVALUATION
MODEL TECHNOLOGY SCHOOLS (MTS) - LEVEL 1
TEACHER SURVEY

(Please feel free to attach to this survey any other comments you wish to make concerning the MTS project or technology use in the schools.)

1. What grade(s) do you teach? _____

2. What is the primary subject you teach? (Check One)

Elementary	_____	Social Science	_____
Language Arts	_____	Art	_____
Foreign Language	_____	Music	_____
Math	_____	Physical Education	_____
Science	_____	Other	_____

3. How many years have you been teaching? ______

4. How many students do you teach on an average day? ______

5. Are you a participant in the MTS project at your school? Yes ___ No ___

If yes, when did you enter the project? Month: _____ Year _____

6. If you are in the project, are you participating: (Check One)

_____ By choice. _____ Because it was required.

7. If you are not in the project, would you like to be? Yes ___ No ___
Why are you not participating? (Check One)

_____	Not interested	_____	Did not know about it
_____	Already know technology	_____	No room in the project at this time
_____	Too time consuming	_____	Was not asked to participate
_____	Other: (state)________________________		

8. Estimate the average number of hours per month you have spent on the following educational technology activities during this school year. If none, list zero.

_____ Receiving Training/Learning Technology
_____ Making Professional Presentations
_____ Providing Training
_____ Coordinating Activities
_____ Developing Materials
_____ Other ______________________________
_____ TOTAL

Approximately how many of these total hours are not compensated? ____

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9. Show how long you have been using technology and the degree of exposure in **your classes** by providing estimates to the questions below:

a) How many years have you been using each type of technology in your teaching?

b) What is the approximate **percentage** of your students that will use or be exposed to the following types of technology in **your classes** this school year?

c) Estimate the **hours** of use or exposure each of these students will receive in each type of technology in **your** classes during an **average month** in this school year.

Types of Technology	a) Number of Yrs. You Have Been Using	b) % Students Exposed to Tech In Your Classes	c) Est. Hrs/Student In Your Classes Per Month
Computers	______	______	______
Camcorder	______	______	______
Printers	______	______	______
T.V.-Cable	______	______	______
T.V.-Videotapes	______	______	______
CD ROM	______	______	______
Video editor	______	______	______
Videodisc player	______	______	______
VCR	______	______	______
Scanner	______	______	______
Slide projector	______	______	______
Multimedial	______	______	______
Other: ______	______	______	______

10. Approximately how many hours do you use educational technology for administrative tasks in an average week, e.g. grading or other student record keeping?

______ Hours/Week

11. Have you found the use of educational technology to be useful in providing the curriculum described in the state curriculum frameworks? (Circle One)

1 - Very Much 2 - Some 3 - Not Much 4 - None

12. Have you developed any technology-related applications, products, or procedures that you have shared with other teachers? (Check Each Line)

	Yes	No	Approximate Number
At your school?	____	____	____
In your district?	____	____	____
In other districts?	____	____	____

13. Approximately how many hours per week does the average student in your class use computers for the following types of activities?

______ Drill and Practice:
______ Problem Solving
______ Computer programming
______ Word processing
______ Other ________________

14. In which of the following ways do you use computer or video technology for instructional purposes on a regular basis, i.e. at least once a week? (Check all that apply)

Video	Computers	
____	____	Do not use educational technology at least once per week
____	____	Whole class presentations
____	____	Small group instruction
____	____	Individual instruction
____	____	Computer lab
____	____	Student-centered instruction
____	____	Other (please describe):

15. What are your future plans for educational technology use? (Check one)

____ Do not plan to use soon
____ Do not use now, but hope to start soon
____ Plan to reduce current educational technology use
____ Will continue to use at current level
____ Plan to expand current educational technology use

16. For the remaining items, indicate **both** the type of effect and the level of impact the use of technology has had in the following areas:

	Type of Effect N = Negative O = No Effect P = Positive (Circle One)			Level of Impact 1 = Minor 2 = Moderate 3 = Significant (Circle One)		
Student Impact:						
Classroom discipline	N	O	P	1	2	3
Cooperation among students	N	O	P	1	2	3
Student Achievement	N	O	P	1	2	3
Interest in subject matter	N	O	P	1	2	3
Problem solving skills	N	O	P	1	2	3
Interest in technology	N	O	P	1	2	3
Completion of assignments	N	O	P	1	2	3
Quality of work produced	N	O	P	1	2	3
Computer skills	N	O	P	1	2	3
Attitude toward school	N	O	P	1	2	3
Teacher Impact:						
Interest in teaching	N	O	P	1	2	3
Collegial interaction	N	O	P	1	2	3
Self-confidence	N	O	P	1	2	3
Efficiency & organization	N	O	P	1	2	3
Feelings of professionalism	N	O	P	1	2	3
Instructional effectiveness	N	O	P	1	2	3
Interest in technology	N	O	P	1	2	3
Size of workload	N	O	P	1	2	3
Curriculum frameworks alignment	N	O	P	1	2	3
Degree of School Support:						
Overall administrative support	N	O	P	1	2	3
Adequacy of training	N	O	P	1	2	3
Involvement in decision making	N	O	P	1	2	3
Access to needed equipment	N	O	P	1	2	3
Assistance in implementation	N	O	P	1	2	3

The Visitor Survey

MODEL TECHNOLOGY SCHOOLS VISITOR FEEDBACK

California Department of Education, Far West Laboratory, and American Institutes for Research

Name: ________________ Title: ________________

District: ________________ School: ________________ Grade(s): ________

Primary Responsibility (if not obvious by title) ________________

____

Mailing Address: ________________

City: ________________ State: ______ Zip: ______ Phone: ________________

Date of Visitation ___/___/___ Length of Visit ______ (Number of hours) ________

How many other representatives from your district were part of the visit? ________

Sites Visited (Specific Schools): ________________

Thank you for visiting the Model Technology Schools (MTS) Project. It was our pleasure to conduct this visit and we would appreciate receiving feedback about its usefulness. **Most of these items require very brief responses and very little writing! We need your feedback.** Such important information will enable us to meet needs of future visitors. Please answer the following questions and return the completed document to us prior to your departure. Thank you for your cooperation.

Background

1. Project Visited. Identify the project you are visiting:

- ☐ Alhambra
- ☐ Los Angeles Unified
- ☐ Cupertino-Fremont
- ☐ Monterey Peninsula
- ☐ Hueneme-Oxnardt
- ☐ Sacramento Unified

2. Reason for Visit. Why did you visit this site? (Check all that apply)

- ☐ AB 1470 School-Based Educ. Tech grantee
- ☐ developing a school/district plan for tech use
- ☐ interested in technology at administrative level
- ☐ curiosity about MTS
- ☐ observe a specific strategy
- ☐ Other (please specify) ________________
  ____
- ☐ plan to apply for tech. grant
- ☐ seeking ideas for integrating technology with the curriculum and instructional program
- ☐ observe a specific strategy
- ☐ seeking ideas for facility design

3. **Source of Information.** How did you learn about MTS? (check all that apply)

- ☐ Conference (please specify)____
- ☐ Promotional materials
- ☐ Recommended by a colleague
- ☐ AB1470 guidelines
- ☐ California Technology Project
- ☐ County Office of Education
- ☐ California Department of Education
- ☐ Publication (e.g. journal article - please specify)______________________________
- ☐ Other (please specify)____

4. **Funding.** How was this visit funded? (Check all that apply)

☐ SIP release days	☐ SB1882 release days
☐ AB1470 grant	☐ General district funds
☐ Personal funds	☐ Other (please specify)________________

5. **Previous Visits.** Have you made similar visits to observe technology in other schools, districts, or projects? (Check all that apply)

- ☐ Other Level I MTS project(s) (please specify)______________________________
- ☐ Level II Academic Model Tech Project(s) (please specify)________________________
- ☐ Other technology projects (please specify)________________________________
- ☐ Other (e.g. workshops, trainings, etc. - please specify)________________________

6. **Materials Supplied.** What materials did you receive prior to the visit (Check all that apply)

☐ Informational packet ☐ Video ☐ Other (please specify)________________

7. **Expectations.** What did you hope to accomplish during the visit? (check all that apply)

☐ General orientation about MTS	☐ Observe some very specific practices
☐ Meet with specific project staff	☐ Other (please specify)______________________

8. Did the MTS staff know in advance what you hoped to accomplish? yes ☐ no ☐

On-Site

9. Fulfillment of Expectations. Did the visit meet your expectations? yes ☐ no ☐ partially ☐

Please explain the positive aspects of your visit: ______________________________

____

____

____

Please explain the negative aspects of your visit: ______________________________

____

____

____

10. Are the curricular and instructional practices you viewed aligned with the state curriculum frameworks? (Check one)

_____ Yes
_____ No
_____ Not enough time and information to judge
_____ Not familiar enough with the frameworks to judge

11. Usage of Time. Please estimate the amount of time used.

	Hours
a) for general orientation..	_____
b) observing specific practices	_____
c) meeting with project staff...	_____
d) other (please specify)______________________________	_____

12. Unexpected Outcomes. Describe any unexpected outcomes from the visit. ____________________

____

____

13. Recommendations. How could the visit be improved? ______________________________

____

____

Follow-up in Your District

14. **Knowledge Gained.** List 3 policies, practices, strategies or ideas that could potentially be adopted or adapted in your district or school.

a. ______________________________

b. ______________________________

c. ______________________________

15. **Implementation.** What immediate actions will you take in your district that are related to this visit? (If none, leave blank)

a. ______________________________

b. ______________________________

c. ______________________________

16. **Purchase of Materials.** Would you be willing to purchase materials or services produced by this MTS project? yes ☐ no ☐ Specify what would be purchased: ______________

17. **Future Contact.** May we contact you in the future to learn how you have adopted or adapted policies or practices used in the MTS project? yes ☐ no ☐

18. **Usefulness for Others.** Would you recommend the visit to others? yes ☐ no ☐ not sure ☐

What type of educator(s) could benefit the most from this visit?

☐ Teachers
☐ Principals
☐ School board members
☐ Superintendent
☐ District curriculum or computer coordinator
☐ Other (please specify)______________

19. **Information Mailings.** Would you like to be placed on a mailing list to receive additional information about the Model Technology Schools Projects and if so check the area(s) of greatest interest:

☐ Technology use planning
☐ Staff Development
☐ Future visitation schedules
☐ Classroom application of technology
☐ Research and Evaluation
☐ All of the above

Please return this completed form to us prior to your departure.

Thank you very much for your time and cooperation in completing these items.

The Elementary Student Survey (English and Spanish Versions)

STUDENT QUESTIONNAIRE (Elementary)

We are interested in your opinion about the technology you use. This is not a test. There are no right or wrong answers. Please circle Yes, No, or Do Not Use.

1.	I like to use computers.	Yes	No	Do Not Use
2.	Calculators help me to learn math.	Yes	No	Do Not Use
3.	Using the computer is hard work.	Yes	No	Do Not Use
4.	It is easier for me to do math (numbers) when I use the computer.	Yes	No	Do Not Use
5.	I help other students use the computer.	Yes	No	Do Not Use
6.	Using ear phones at the listening station helps me learn.	Yes	No	Do Not Use
7.	I use a computer at home for schoolwork.	Yes	No	Do Not Use
8.	It is easy to solve problems using the computer.	Yes	No	Do Not Use
9.	It's easier for me to write a story when I use the computer.	Yes	No	Do Not Use
10.	Other students help me use the computer.	Yes	No	Do Not Use
11.	I wish I could use the computer more often.	Yes	No	Do Not Use
12.	The television in my class helps me learn.	Yes	No	Do Not Use
13.	I like to use the camcorder to do projects.	Yes	No	Do Not Use
14.	I watch educational or public television at home.	Yes	No	Do Not Use
15.	I like using telecommunications to talk with students in other schools and countries.	Yes	No	Do Not Use

Would you like to tell us anything else about using computers or other technology? Write your answer on the back of this form.

THANK YOU.

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CUESTIONARIO ESTUDIANTIL (Primario)

Estamos interesados en su opinión sobre la tecnología. Esto no es un examen. No hay respuestas malas ni correctas. Por favor marque SÍ, NO o NO LA (LO) USO.

1. Me gusta usar las computadoras. **SÍ NO NO LA USO**
2. Las calculadoras me ayudan a aprender matemáticas. **SÍ NO NO LA USO**
3. Es difícil usar la computadora. **SÍ NO NO LA USO**
4. Es más fácil hacer las matematicas (o usar numeros) cuando uso la computadora. **SÍ NO NO LA USO**
5. Ayudo a otros estudiantes usar la computadora. **SÍ NO NO LA USO**
6. Usando el auricular y el grabador en un "listening station" me ayuda a aprender. **SÍ NO NO LO USO**
7. Uso la computadora en casa para hacer mi tarea. **SÍ NO NO LA USO**
8. Es fácil resolver problemas usando la computadora. **SÍ NO NO LA USO**
9. Es más fácil escribir un cuento cuando uso la computadora. **SÍ NO NO LA USO**
10. Otros estudiantes me ayudan a usar la computadora. **SÍ NO NO LA USO**
11. Desearía usar la computadora más. **SÍ NO NO LA USO**
12. La televisión en mi clase me ayuda a aprender. **SÍ NO NO LA USO**
13. Me gusta usar el "camcorder" (máquina de video) para hacer proyectos. **SÍ NO NO LO USO**
14. En casa miro televisados educaciónales o públicos. **SÍ NO NO LA USO**
15. Me gusta usar telecomunicación para hablar con estudiantes en otras escuelas o en otros países. **SÍ NO NO LA USO**

¿Quería Ud. decirnos algo más de las computadoras o de otro tipo de tecnología? Escriba su respuesta detrás de ésta página.

GRACIAS

The Secondary Student Survey
(English and Spanish Versions)

STUDENT QUESTIONNAIRE (Secondary)

We are interested in your opinion about using technology. This is not a test. There are no right or wrong answers. Please place an "X" in the space below the answer to describe how you feel about each statement. If you do not use the technology, check "DO NOT USE."

		AGREE A LOT	AGREE A LITTLE	DISAGREE A LITTLE	DISAGREE A LOT	DO NO USE
1.	I like using computers.	___	___	___	___	___
2.	I like using the camcorder to complete projects.	___	___	___	___	___
3.	I think using computers makes learning easier.	___	___	___	___	___
4.	Using computers helps me learn faster.	___	___	___	___	___
5.	I help other people learn to use the technology.	___	___	___	___	___
6.	I also use computers when I am not in class.	___	___	___	___	___
7.	I would rather work with a paper and pencil (pen) than use a computer.	___	___	___	___	___
8.	Using laser disks helps me learn.	___	___	___	___	___
9.	I use a computer at home to complete my homework.	___	___	___	___	___
10.	I watch educational or public television at home.	___	___	___	___	___
11.	Televised presentations in class help me learn.	___	___	___	___	___
12.	Since I started using technology, I have more conversations with my friends about school subjects.	___	___	___	___	___

Please complete more questions on the back of this page.

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STUDENT QUESTIONNAIRE (Secondary) - page 2

	AGREE A LOT	AGREE A LITTLE	DISAGREE A LITTLE	DISAGREE A LOT	DO NOT USE
13. Using technology has helped me get along better with my teacher.	___	___	___	___	___
14. I try not to miss school on the days I use the computer.	___	___	___	___	___
15. Using a calculator makes math more interesting.	___	___	___	___	___
16. I learn a lot from instructional television.	___	___	___	___	___
17. I learn by telecommunications with students in other schools and countries.	___	___	___	___	___
18. Watching a video-tape makes lessons more interesting.	___	___	___	___	___
19. Using technology makes me feel smart.	___	___	___	___	___

Thank you very much. Would you like to tell us anything else about using computers or other technology? Write your answer in the space below.

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CUESTIONARIO ESTUDIANTIL (Secundaria)

Estamos interesados en su opinión sobre el usamiento de tecnología. Esto no es un examen. No hay respuestas malas ni correctas. Por favor ponga una "X" debajo de la respuesta que demuestra como se siente. Si no usa la tecnología, ponga una "X" debajo "NO LA (LO) USO".

	ESTOY DE ACUERDO (MUCHO)	**ESTOY DE ACUERDO (UN POCO)**	**NO ESTOY DE ACUERDO (UN POCO)**	**NO ESTOY DE ACUERDO (MUCHO)**	NO LA (LO) USO
1. Me gusta usar las computadoras.	______	______	______	______	______
2. Me gusta usar el "camcorder" (máquina de video) para completar mis proyectos.	______	______	______	______	______
3. Pienso que usando las computadoras hace el aprendizaje más facil.	______	______	______	______	______
4. Usando computadoras me ayuda a aprender más rápido.	______	______	______	______	______
5. Ayudo a otros a aprender a usar la tecnología.	______	______	______	______	______
6. También uso las computadoras cuando no estoy en clase.	______	______	______	______	______

Por favor complete las preguntas que siguen ésta página.

	ESTOY DE ACUERDO (MUCHO)	ESTOY DE ACUERDO (UN POCO)	NO ESTOY DE ACUERDO (UN POCO)	NO ESTOY DE ACUERDO (MUCHO)	NO LA (LO) USO
7. Preferia trabajar con papel y lapiz (pluma) en vez de usar una computadora.	______	______	______	______	______
8. Usando los "laser disks" me ayudan a aprender.	______	______	______	______	______
9. En casa, uso una computadora para completar mi tarea.	______	______	______	______	______
10. Miro televisados educacionales o públicos en casa.	______	______	______	______	______
11. En casa, las presentaciones televisadas me ayudan a aprender.	______	______	______	______	______
12. Desde que aprendi a usar la computadora, tengo más conversaciones con mis amigos sobre materia académica.	______	______	______	______	______
13. Usando la tecnologia me ha ayudado a tener una buena amistad con mi maestra.	______	______	______	______	______

Por favor complete las preguntas que siguen ésta página.

	ESTOY DE ACUERDO (MUCHO)	ESTOY DE ACUERDO (UN POCO)	NO ESTOY DE DE ACUERDO (UN POCO)	NO ESTOY DE ACUERDO (MUCHO)	NO LA (LO) USO
14. Trato de no faltar clase en los días cuando uso la computadora.	______	______	______	______	______
15. Usando una calculador hace matemáticas más interesante.	______	______	______	______	______
16. Aprendo mucho de la televisión instruccional.	______	______	______	______	______
Por medio de telecomunicaciónes, aprendo de estudiantes en otras escuelas y en otros países.	______	______	______	______	______
18. Mirando un "video" hace las lecciónes más interesantes.	______	______	______	______	______
19. Usando la tecnología me hace sentir inteligente.	______	______	______	______	______

Muchas gracias. ¿Quería decirnos algo más sobre el usamiento de computadoras o sobre otro tipo de tecnología? Escriba su respuesta detrás de ésta página.

APPENDIX B:

SURVEY RESULTS

- Teacher Survey
- Visitor Survey
- Student Survey

Teacher Survey

CETAP EVALUATION
MODEL TECHNOLOGY SCHOOLS (MTS) - LEVEL 1
TEACHER SURVEY

(Please feel free to attach to this survey any other comments you wish to make concerning the MTS project or technology use in the schools.)

1. What grade(s) do you teach? _____

pre schl - 3rd grd	90	16.4%
4th grd - 6th grd	127	23.1%
7th grd - 9th grd	285	51.8%
10th grd - 12th grd	48	8.7%

2. What is the primary subject you teach? (Check One)

Elementary	119 (21.1%)	Social Science	46 (8.2%)
Language Arts	141 (25.0%)	Art	9 (1.6%)
Foreign Language	24 (4.3%)	Music	9 (1.6%)
Math	78 (13.8%)	Physical Education	24 (4.3%)
Science	47 (8.3%)	Other	67 (11.9%)

3. How many years have you been teaching? 16.6 (AVG)

4. How many students do you teach on an average day? 104.7 (AVG)

5. Are you a participant in the MTS project at your school? Yes 344 (61.3%) No 217 (38.7%)

If yes, when did you enter the project?

Year	Number	Percent
85	1	0.3
86	15	4.9
87	62	20.1
88	63	20.5
89	51	16.6
90	88	28.6
91	28	9.1

6. If you are in the project, are you participating: (Check One)

299 By choice. (84.9%)

53 Because it was required. (15.1%)

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MTS Teacher Survey - Page 2

7. If you **are not** in the project, would you like to be? Yes 105 (54.4%) No 88 (45.6%)

Why are you **not** participating? (Check One)

32 (16.4%) Not interested
6 (3.1%) Already know technology
36 (18.5%) Too time consuming
49 (25.1%) Other: (state) ____________________
12 (6.2%) Did not know about it
13 (6.7%) No room in the project at this time
47 (24.1%) Was not asked to participate

8. Estimate the average number of hours per month you have spent on the following educational technology activities during this school year. If none, list zero.

Average	
6.7	Receiving Training/Learning Technology
2.1	Making Professional Presentations
2.9	Providing Training
4.8	Coordinating Activities
8.8	Developing Materials
6.4	Other ____________________
18.6	TOTAL

Approximately how many of these total hours are not compensated? 13.3

9. Show how long you have been using technology and the degree of exposure in your classes by providing estimates to the questions below:

a) How many years have you been using each type of technology in your teaching?

b) What is the approximate **percentage** of your students that will use or be exposed to the following types of **technology** in **your** classes this school year?

c) Estimate the **hours** of use or exposure each of these students will receive in each type of technology in **your classes** during an **average month** in this school year.

Types of Technology	a) Number of Yrs. You Have Been Using	b) % Students Exposed to Tech In Your Classes	c) Est. Hrs/Student In Your Classes Per Month
Computers	4.1	77.3	12.9
Camcorder	2.5	48.9	2.9
Printers	3.7	67.3	7.8
T.V.-Cable	3.4	57.0	3.6
T.V.-Videotapes	5.3	86.6	4.7
CD ROM	0.6	18.3	0.9
Video editor	0.7	12.2	1.9

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Videodisc player	1.2	43.6	4.0
VCR	5.1	87.2	4.8
Scanner	0.8	14.0	0.9
Slide projector	9.0	48.3	1.3
Multimedial	3.0	37.7	4.4
Other: __________	5.1	66.8	4.5

10. Approximately how many hours do you use educational technology for administrative tasks in an average week, e.g. grading or other student record keeping?

2.6 Hours/Week

11. Have you found the use of educational technology to be useful in providing the curriculum described in the state curriculum frameworks? (Circle One)

1 - Very Much	2 - Some	3 - Not Much	4 - None
117 (35.3%)	212 (42.3%)	57 (11.4%)	55 (11.0%)

12. Have you developed any technology-related applications, products, or procedures that you have shared with other teachers? (Check Each Line)

	# Yes	# No	% Yes	% No	Approximate Number (Average)
At your school?	231	273	45.8	54.2	5.9
In your district?	125	333	27.3	72.7	6.8
In other districts?	95	351	21.3	78.7	6.4

13. Approximately how many hours per week does the average student in your class use computers for the following types of activities?

(Averages)

1.3 Drill and Practice:

1.3 Problem Solving

0.5 Computer programming

1.7 Word processing

0.9 Other ________________

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14. In which of the following ways do you use computer or video technology for instructional purposes on a regular basis, i.e. at least once a week? (Check all that apply)

(Numbers Responding)			*(Percent Responding)*	
Video	Computers		Videos %	Computers %
113	97	Do **not** use educational technology at least once per week	19.79	16.99
285	188	Whole class presentations	49.91	32.92
110	177	Small group instruction	19.26	31.0
72	203	Individual instruction	12.61	35.55
42	222	Computer lab	7.36	38.88
99	108	Student-centered instruction	17.34	18.91
23	25	Other (please describe):	4.03	4.38

15. What are your future plans for educational technology use? (Check one)

34 (6.5%)	Do not plan to use soon
69 (13.1%)	Do not use now, but hope to start soon
1 (0.2%)	Plan to reduce current educational technology use
115 (21.9%)	Will continue to use at current level
306 (58.3%)	Plan to expand current educational technology use

16. For the remaining items, indicate **both** the type of effect and the level of impact the use of technology has had in the following areas:

	NEGATIVE			**NO EFFECT**	**POSITIVE**		
	Minor	**Mod.**	**Sig.**		**Minor**	**Mod.**	**Sig.**
Student Impact: Classroom discipline	4 (0.8%)	2 (0.2%)	1 (0.2%)	206 (44.3%)	36 (7.7%)	115 (24.7%)	101 (21.7%)
Cooperation among students	0 (0.0%)	2 (0.4%)	0 (0.0%)	119 (25.5%)	38 (8.1%)	145 (31.1%)	162 (34.7%)
Student Achievement	0 (0.0%)	0 (0.0%)	1 (0.2%)	88 (18.9%)	39 (8.4%)	197 (42.4%)	139 (29.9%)
Interest in subject matter	0 (0.0%)	0 (0.0%)	1 (0.2%)	64 (13.6%)	37 (7.9%)	164 (35.0%)	202 (43.1%)
Problem solving skills	2 (0.4%)	1 (0.2%)	1 (0.2%)	153 (34.1%)	36 (8.0%)	142 (31.7%)	113 (25.2%)

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	NEGATIVE			NO EFFECT	POSITIVE		
	Minor	Mod.	Sig.		Minor	Mod.	Sig.
Interest in technology	1 (0.2%)	0 (0.0%)	0 (0.0%)	80 (17.5%)	36 (7.9%)	128 (28.1%)	210 (46.1%)
Completion of assignments	1 (0.2%)	2 (0.4%)	1 (0.2%)	204 (45.0%)	18 (3.9%)	127 (28.0%)	100 (22.0%)
Quality of work produced	0 (0.0%)	0 (0.0%)	1 (0.2%)	136 (30.1%)	24 (5.3%)	126 (27.9%)	164 (36.3%)
Computer skills	0 (0.0%)	1 (0.2%)	0 (0.0%)	113 (25.6%)	23 (5.2%)	111 (25.1%)	193 (43.7%)
Attitude toward school	0 (0.0%)	0 (0.0%)	0 (0.0%)	126 (28.3%)	44 (9.8%)	142 (31.9%)	133 (29.8%)
Teacher Impact: Interest in teaching	0 (0.0%)	1 (0.2%)	1 (0.2%)	92 (20.0%)	35 (7.6%)	135 (29.3%)	196 (42.6%)
Collegial interaction	3 (0.6%)	3 (0.6%)	0 (0.0%)	130 (29.0%)	36 (8.0%)	128 (28.5%)	148 (33.0%)
Self-confidence	6 (1.3%)	10 (2.2%)	1 (0.2%)	146 (32.0%)	28 (6.1%)	126 (27.6%)	138 (30.3%)
Efficiency & organization	4 (0.8%)	7 (1.5%)	0 (0.0%)	128 (28.5%)	24 (5.3%)	108 (24.1%)	177 (39.5%)
Feelings of professionalism	4 (0.8%)	3 (0.6%)	1 (0.2%)	122 (26.9%)	26 (5.7%)	121 (26.7%)	175 (38.7%)
Instructional effectiveness	0 (0.0%)	1 (0.2%)	0 (0.0%)	94 (20.8%)	43 (9.5%)	146 (32.3%)	168 (37.1%)
Interest in technology	0 (0.0%)	2 (0.4%)	0 (0.0%)	72 (15.7%)	29 (6.3%)	139 (30.4%)	215 (47.0%)
Size of workload	20 (4.5%)	44 (10.0%)	66 (15.1%)	146 (33.4%)	21 (4.8%)	68 (15.6%)	71 (16.2%)
Curriculum frameworks align.	0 (0.0%)	2 (0.4%)	1 (0.2%)	200 (47.6%)	25 (5.9%)	101 (24.0%)	91 (21.6%)
Degree of School Support: Overall admin. support	8 (1.7%)	6 (1.3%)	5 (1.1%)	93 (20.4%)	32 (7.0%)	106 (23.3%)	204 (44.9%)
Adequacy of training	10 (2.2%)	18 (3.9%)	7 (1.5%)	107 (23.7%)	29 (6.4%)	134 (29.7%)	146 (32.3%)
Involvement in decision making	7 (1.5%)	11 (2.4%)	8 (1.8%)	188 (42.6%)	31 (7.0%)	89 (20.1%)	107 (24.2%)
Access to needed equipment	15 (3.3%)	17 (3.7%)	14 (3.1%)	86 (19.2%)	36 (8.0%)	114 (25.4%)	166 (37.0%)
Assistance in implementation	6 (1.3%)	9 (2.0%)	8 (1.7%)	109 (24.3%)	32 (7.1%)	115 (25.6%)	169 (37.7%)

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Visitor Survey

SUMMARY OF FREQUENCIES
MODEL TECHNOLOGY SCHOOLS VISITOR FEEDBACK

Frequencies are shown for the Visitor's Survey formats lending themselves to this form of reporting. Percent allocations are not shown for questions indicating "check all that apply" and no results are shown for open-ended questions. These results will be presented in a subsequent, analysis volume.

Background

1. **Project Visited**. Identify the project you are visiting:

Frequency	Percent	
77	21.6%	Alhambra
1	0.3%	Los Angeles Unified
49	13.7%	Cupertino-Fremont
102	28.6%	Monterey Peninsula
126	35.3%	Hueneme-Oxnard
2	0.6%	Sacramento Unified

2. **Reason for Visit**. Why did you visit this site?

Frequency	
20	AB 1470 School-Based Educ. Tech grantee
115	Developing a school/district plan for tech use
64	Interested in technology at administrative level
158	Curiosity about MTS
52	Observe a specific strategy
67	Other
39	Plan to apply for tech. grant
222	Seeking ideas for integrating technology with the curriculum and instructional program
44	Observe a specific strategy
90	Seeking ideas for facility design

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3. **Source of Information**. How did you learn about MTS?

Frequency	
74	Conference
31	Promotional Materials
118	Recommended by a colleague
15	AB1470 guidelines
44	California Technology Project
51	County Office Education
10	California Department of Education
13	Publication (e.g., journal article - please specify)
114	Other

4. **Funding**. How was this visit funded?

Frequency	
27	SIP release days
9	AB1470 grant
36	Personal Funds
22	SB1882 release days
138	General district funds
113	Other

5. **Previous Visits.** Have you made similar visits to observe technology in other schools, districts, or projects?

Frequency	
40	Other Level I MTS project(s)
2	Level II Academic Model Tech Project(s)
30	Other technology projects
56	Other (e.g. workshops, training, etc. - please specify)

6. **Materials Supplied.** What materials did you receive prior to the visit?

Frequency	
203	Informational packet
36	Video
42	Other

7. **Expectations.** What did you hope to accomplish during the visit?

Frequency	
280	General orientation about MTS
79	Meet with specific project staff
195	Observe some very specific practices
33	Other

8. Did the MTS staff know in advance what you hoped to accomplish?

Frequency	Percent	
232	73.9%	Yes
82	26.1%	No

9. **Fulfillment of Expectations.** Did the visit meet your expectations?

Frequency	Percent	
279	83.0%	Yes
5	1.5%	No
52	15.5%	Partially

10. Are the curricular and instructional practices you viewed aligned with the state curriculum frameworks?

Frequency	Percent	
194	57.6%	Yes
1	0.3%	No
100	29.7%	Not enough time and information to judge
42	12.5%	Not familiar enough with the frameworks to judge

11. **Usage of Time.** Please estimate the amount of time used.

12. **Unexpected Outcomes.** Describe any unexpected outcomes from the visit.

13. **Recommendations.** How could the visit be improved?

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14. **Knowledge Gained.** List 3 policies, practices, strategies or ideas that could potentially be adopted or adapted in your district or school.

15. **Implementation.** What immediate actions will you take in your district that are related to this visit?

16. **Purchase of Materials.** Would you be willing to purchase materials or services produced by this MTS project?

Frequency	Percent	
137	74.9%	Yes
46	25.1%	No

17. **Future Contact.** May we contact you in the future to learn how you have adopted or adapted policies or practices used in the MTS project?

Frequency	Percent	
137	74.9%	Yes
46	25.1%	No

18. **Usefulness for Others.** Would you recommend the visit to others?

Frequency	
303	Yes
2	No
7	Not sure

What type of educator(s) could benefit the most from this visit?

279	Teachers
245	Principals
212	School board members
179	Superintendent
292	District curriculum or computer coordinator
71	Other

19. **Information Mailings.** Would you like to be placed on a mailing list to receive additional information about the Model Technology Schools Projects and if so check the area(s) of greatest interest:

Frequency	
111	Technology use planning
103	Staff development
57	Future visitation schedules
168	Classroom application of technology
69	Research and evaluation

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Student Survey

STUDENT QUESTIONNAIRE (Elementary)

We are interested in your opinion about the technology you use. This is not a test. There are no right or wrong answers. Please circle Yes, No, or Do Not Use.

		Yes	No	Do Not Use
1.	I like to use computers.	1008 (95.2%)	18 (1.7%)	33 (3.1%)
2.	Calculators help me to learn math.	533 (50.5%)	301 (28.5%)	221 (20.9%)
3.	Using the computer is hard work.	202 (19.2%)	814 (77.5%)	34 (3.2%)
4.	It is easier for me to do math (numbers) when I use the computer.	503 (47.8%)	413 (39.3%)	136 (12.9%)
5.	I help other students use the computer.	653 (61.8%)	362 (34.3%)	41 (3.9%)
6.	Using ear phones at the listening station helps me learn.	320 (30.6%)	266 (25.5%)	459 (43.9%)
7.	I use a computer at home for schoolwork.	197 (18.8%)	545 (52.0%)	306 (29.2%)
8.	It is easy to solve problems using the computer.	664 (63.5%)	275 (26.3%)	107 (10.2%)
9.	It s easier for me to write a story when I use the computer.	813 (77.1%)	179 (17.0%)	63 (6.0%)
10.	Other students help me use the computer.	693 (66.0%)	327 (31.1%)	30 (2.9%)
11.	I wish I could use the computer more often.	961 (91.0%)	82 (7.8%)	13 (1.2%)
12.	The television in my class helps me learn.	633 (60.2%)	287 (27.3%)	131 (12.5%)
13.	I like to use the camcorder to do projects.	500 (47.7%)	161 (15.3%)	388 (37.0%)
14.	I watch educational or public television at home.	718 (68.4%)	311 (29.6%)	21 (2.0%)
15.	I like using telecommunications to talk with students in other schools and countries.	351 (33.2%)	155 (14.7%)	551 (52.[illegible]

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STUDENT QUESTIONNAIRE (Secondary)

We are interested in your opinion about using technology. This is not a test. There are no right or wrong answers. Please place an "X" in the space below the answer to describe how you feel about each statement. If you do not use the technology, check "DO NOT USE."

		AGREE A LOT	AGREE A LITTLE	DISAGREE A LITTLE	DISAGREE A LOT	DO NOT USE
1.	I like using computers.	853 (67.2%)	321 (25.3%)	48 (3.8%)	14 (1.1%)	33 (2.6%)
2.	I like using the camcorder to complete projects.	383 (30.4%)	332 (26.3%)	106 (8.4%)	24 (1.9%)	415 (32.9%)
3.	I think using computers makes learning easier.	660 (52.1%)	464 (36.6%)	92 (7.3%)	30 (2.4%)	21 (1.7%)
4.	Using computers helps me learn faster.	459 (36.2%)	478 (37.7%)	226 (17.8%)	69 (5.4%)	35 (2.8%)
5.	I help other people learn to use the technology.	269 (21.3%)	451 (35.7%)	203 (16.1%)	149 (11.8%)	190 (15.1%)
6.	I also use computers when I am not in class.	460 (36.5%)	300 (23.8%)	106 (8.4%)	87 (6.9%)	307 (24.4%)
7.	I would rather work with a paper and pencil (pen) than use a computer.	121 (9.7%)	190 (15.2%)	297 (23.7%)	590 (47.1%)	55 (4.4%)
8.	Using laser disks helps me learn.	285 (22.7%)	390 (31.0%)	141 (11.2%)	59 (4.7%)	383 (30.4%)
9.	I use a computer at home to complete my homework.	228 (18.2%)	223 (17.8%)	103 (8.2%)	122 (9.7%)	578 (46.1%)
10.	I watch educational or public television at home.	269 (21.5%)	386 (30.8%)	195 (15.6%)	189 (15.1%)	215 (17.1%)
11.	Televised presentations in class help me learn.	424 (33.8%)	519 (41.4%)	165 (13.1%)	74 (5.9%)	73 (5.8%)

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Please complete more questions on the back of this page.

STUDENT QUESTIONNAIRE (Secondary) - page 2

		AGREE A LOT	AGREE A LITTLE	DISAGREE A LITTLE	DISAGREE A LOT	DO NOT USE
12.	Since I started using technology, I have more conversations with my friends about school subjects.	196 (15.6%)	340 (27.0%)	283 (22.5%)	304 (24.2%)	134 (10.7%)
13.	Using technology has helped me get along better with my teacher.	216 (17.5%)	400 (32.3%)	288 (23.3%)	218 (17.6%)	115 (9.3%)
14.	I try not to miss school on the days I use the computer.	390 (31.4%)	283 (22.8%)	206 (16.6%)	238 (19.1%)	126 (10.1%)
15.	Using a calculator makes math more interesting.	511 (41.3%)	377 (30.5%)	160 (12.9%)	139 (11.2%)	50 (4.0%)
16.	I learn a lot from instructional television.	258 (20.8%)	463 (37.4%)	244 (19.7%)	142 (11.5%)	131 (10.6%)
17.	I learn by telecommunications with students in other schools and countries.	143 (11.6%)	196 (15.8%)	136 (11.0%)	142 (11.5%)	620 (50.1%)
18.	Watching a video-tape makes lessons more interesting.	613 (49.3%)	420 (33.8%)	119 (9.6%)	54 (4.3%)	38 (3.1%)
9.	Using technology makes me feel smart.	472 (38.1%)	442 (35.6%)	150 (12.1%)	116 (9.4%)	60 (4.8%)

Thank you very much. Would you like to tell us anything else about using computers or other technology? Write your answer in the space below.

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APPENDIX C:

INTERVIEW PROTOCOLS

(Note that a common set of topics was used for all five types of respondents. However, not all topics were covered with all respondents. The "X's" on the protocol indicate that this topic was to be covered with this type of respondent).

MODEL TECHNOLOGY SCHOOLS - LEVEL 1 - INTERVIEW OUTLINE

		Project Director	District Administrator	Principal	Site Coordinator	Teachers
I.	**Background Information**					
1.	History of individual with the project	X	X	X	X	X
2.	Background of technology use in the district	X	X			
3.	Rate prior use for district/ school on a scale of 1 to 10	X	X	X	X	X
4.	Background of technology use at the school	X		X	X	
5.	Impetus for bidding for this project	X				
6.	Project integration/district	X	X			
7.	Integration of project into the school	X		X	X	X
8.	Impact of project on status of technology in district/school	X	X	X	X	
II.	**Planning**					
1.	District administration directly involved in the planning process for this project	X				
2.	Interface between project planning and the district's overall technology use plan	X	X			
3.	Impact of planning process for this project on school decision making	X		X	X	
4.	Critical incidences regarding project planning at project/ school level	X			X	X
	Plans for the future of technology	X	X	X		

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MODEL TECHNOLOGY SCHOOLS · LEVEL 1 · INTERVIEW OUTLINE (page 2)

		Project Director	District Administrator	Principal	Site Coordinator	Teachers
6.	Plans for specific project-initiated activities.	X	X	X		
III.	**Content**					
A.	Curriculum					
1.	Compelling reasons for use/nonuse of technology in curriculum	X	X		X	X
2.	Relationship between use/nonuse of technology and curriculum frameworks	X			X	
B.	Staff Development					
1.	Use of trained technology staff now and in the future.	X	X	X		
C.	Learning Resources Management	X				
D.	Dissemination and Marketing					
1.	Current status re dissemination/marketing	X				
E.	Evaluation					
1.	Use of findings	X			X	
2.	Relationship with evaluation team	X				
3.	Future of evaluation re technology	X				
IV.	**Project Implementation**					
1.	Lessons learned	X			X	X
V.	**Support**					
1.	Critical incidences regarding level of support	X		X	X	X
2.	Future support for continuing project	X				

MODEL TECHNOLOGY SCHOOLS - LEVEL 1 - INTERVIEW OUTLINE (page 3)

		Project Director	District Administrator	Principal	Site Coordinator	Teachers
VI.	**Cost**					
1.	Cost-effectiveness of technology expenditures	X	X	X	X	X
2.	Use of local funds if project ends	X	X			
VII.	**Outcomes**					
1.	Most compelling overall quantitative evidence of outcomes	X		X	X	
2.	Ways of conceptualizing outcomes in this context	X				
3.	Critical incidents re outcomes for specific populations (e.g., student, teacher, aides, clerical staff, principals, district administrators, business partners, and parents).	X			X	X
4.	The best/worst thing about this project from your perspective.	X	X	X	X	X
5.	Impact of the project on administrative functions within the district/school/classroom	X		X		
VIII.	**Recommendations**					
1.	Major recommendations to the state regarding future use of technology	X	X	X	X	X
2.	Major recommendations to the state regarding implementation of projects of this type	X	X	X	X	X
IX.	**Other**					
1.	Experience of being "in" or "out" of project	X				X